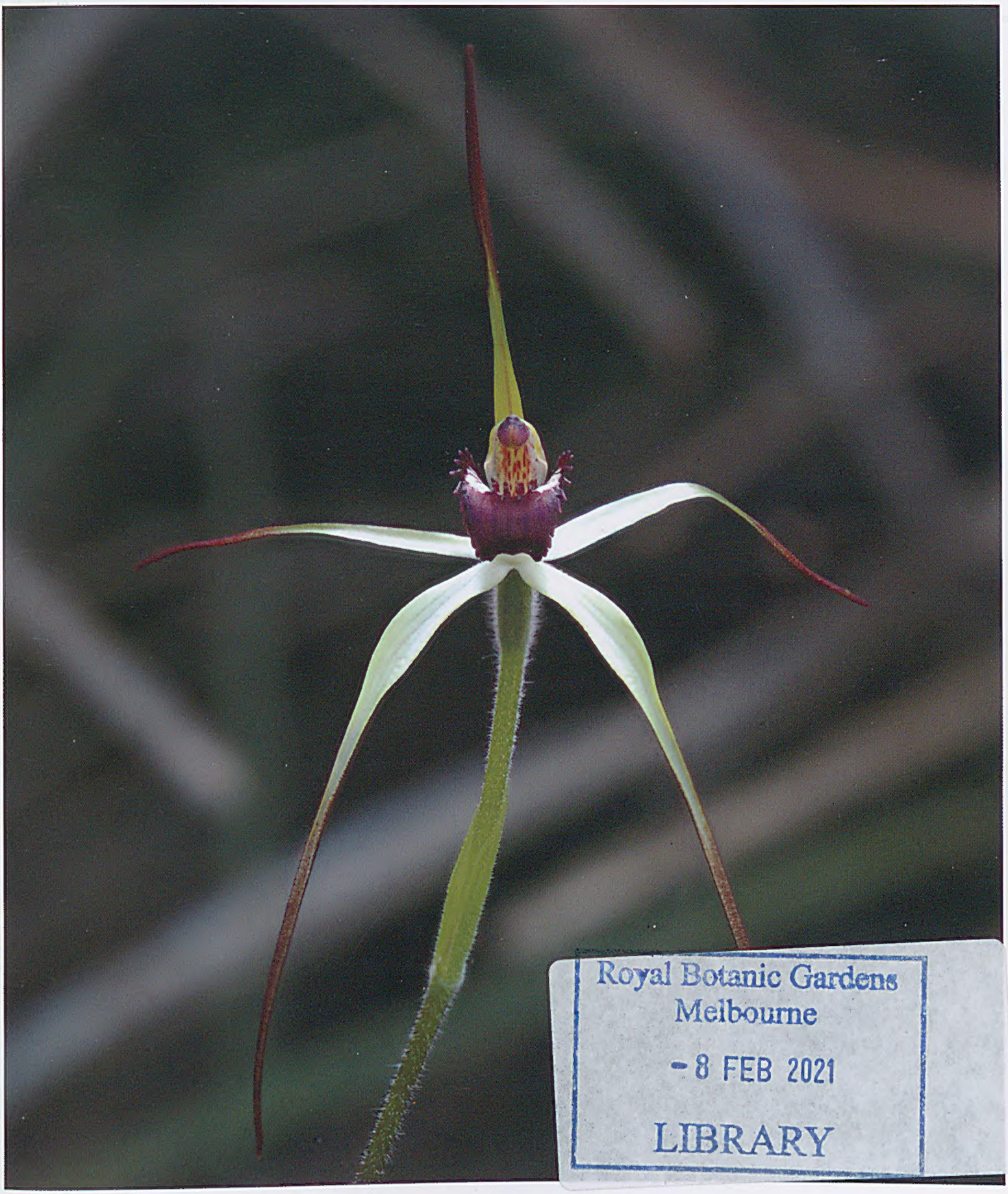
Volume 20, Number 2 | December 2020

The Orchadian

Official Journal of the Australasian Native Orchid Society Inc.



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Caladenia behrii Belair National Park, South Australia Photo Leo Davis

The Orchadian

Official Journal of the Australasian Native Orchid Society Inc.
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Contents

Editorial	Peter B. Adams	3
President's Report	Peter B. Adams	4
Australian Orchid Hybrids of Bill and Jean Cannons, Wayside Nursery, Port Macquarie	Peter B. Adams	5
Lifespan, Flowering Record and Reproductive Success of *Caladenia behrii* Schltdl. in Belair National Park, South Australia	Leo Davis	14
The Skill of Artful Neglect: Confessions from a Novice Grower	Matt Renner	20
Two New Bougainvillean Species of *Dendrobium* section *Grastidium*	Paul Ormerod	26
Microclimates and Their Implementation in Newcastle, New South Wales	Carole Barnett	31
The *Sarcochilus* Galaxy Story	David Butler	37
Awards Numbers 382 — 396		42
Vale Wayne Harris	Dave Groffen	47

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Editorial

This issue has a strong emphasis on culture and conservation, two key ANOS activities where there are often few contributions. These are prime objectives of ANOS and the articles may inspire some reflection and revision of cultural practice, and an appreciation of how long terrestrial species can survive underground without producing leaves and flowers. The time to remain dormant underground seems to be up to many years, as evidenced by Leo Davis' paper on *Caladenia behrii* in South Australia, and David James' contribution on *Thelymitra* in the Granite Belt in the September issue.

The history of Australian orchid breeding and growers is another area that has many gaps in the record. The best way to acknowledge and appreciate their efforts as to record and publish them for current and future members. I was fortunate to collect information about Bill and Jean Cannons, two of the pioneers in hybridising. Later in their life I met them at their home in Maclean, coastal northern New South Wales, and discussed their breeding projects while looking at the books outlining their crosses. Some of their catalogues are reproduced in this issue, including a relatively small number of crosses by today's standards, but some very important ones for cool and hot/cold dendrobiums and Aeridinae intergenerics that later developed.

The cultural articles cover a wide range of subjects and David Butler tells the story of *Sarcochilus* Galaxy that has produced a range of exciting coloured flowers. Matt Renner outlines his starting point in Australian orchid culture, and Carole Barnett uses a knowledge of natural microclimates to adapt her culture of a wide range of different plants in the Newcastle area.

Paul Ormerod has discovered in herbarium collections, two more species of the large *Dendrobium* section *Grastidium* which is best known to Australians by five species in north Queensland. Identifying and describing the New Guinea relatives is an important contribution to our understanding of the total orchid flora of the Australasian region.

Peter Adams

President's Report

An unusual year has passed, with much diminished ANOS group activity due to the COVID pandemic and resultant restrictions. This is an unprecedented time for orchid growers. After February, 2020 face-to-face meetings were largely not possible, but technology allowed some meetings over the internet for some groups without members going out of their homes. These developments brought innovations and possibilities to expand contact with people at a distance when the pandemic ends.

ANOS judging was suspended for most of the year so few awards have been made, and most spring shows were cancelled. Some interstate ANOS members attended the ANOS Melbourne Suburbs Group meetings, which were structured to continue judge training by presenting major course topics and using photographs for practice in pointing up.

The flowering season was variable in quality with some areas in eastern Australia reporting lower flowering frequency and generally poor results. Many *Dendrobium* and *Sarcochilus* flowered early and attempted crosses had a high success rate, with pods developing rapidly compared to season 2019. Seed quantity and quality also appears to be good, according to flasking services.

There needs to be much more seedling production by ANOS members, if groups are to be supplied with a choice of plants suitable for their local area. Commercial production and availability of seedlings is reducing so this becomes even more important.

I hope that more normal activities and a renewed interest in orchid activities will return in 2021.

Peter Adams

ANOS Groups and Societies

Current contact details can be found at **anos.org.au** or in the individual group website.

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ANOS Kabi Inc.(Brisbane)
ANOS Mackay and District
ANOS Townsville Inc.
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ANOS Far North Coast Inc.
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ANOS New Zealand Native Orchid Group

Australian Orchid Hybrids of Bill and Jean Cannons, Wayside Nursery, Port Macquarie

Text Peter Adams | pbadams45@gmail.com.
School of Biosciences, University of Melbourne and National Herbarium, Royal Botanic Gardens, Melbourne

Summary

Bill and Jean Cannons were pioneers in Australian orchid breeding. At their Wayside Nursery at Port Macquarie they produced the hybrids *Dendrobium* Hastings, *D.* Wonga and *D.* Peewee, *Sarcochilus* Weinhart and three intergenerics, *Sarconopsis* Jean Cannons, *Sarconopsis* Macquarie Sunset and *Sarconopsis* Macquarie Lilac. In the same period, they produced early *D. kingianum* and *D. speciosum* hybrids, many new cattleyas, and soft and hard caned dendrobiums, which were grown to perfection by members of the Hastings River Orchid Society and exhibited at their spring show, a consistently outstanding event on the New South Wales mid north coast.

Introduction

Bill and Jean Cannons are best known for establishing Wayside Nursery at Port Macquarie around 1960, which specialized in importing and breeding cattleyas, especially colourful small and medium sized flowers, but also some larger purple and white exhibition types. They registered over 100 *Cattleya* hybrids up to 1982. Non-commercial Australian native orchids were a secondary line of activity and interest. They had very good interactions with local growers and assembled a small collection of Australian species and hybrids to begin a breeding program, only collecting plants from the bush on one occasion. Several people assisted them with plant material, including Kel Ellis, Bas Borger, Arthur Lord, John Lamont, John Tunstead and Bob Munro (Adams and Lawson 1995). Material for this account has been assembled over many years and there may be more available in archives or the memories of people who knew them.

Personal Backgrounds

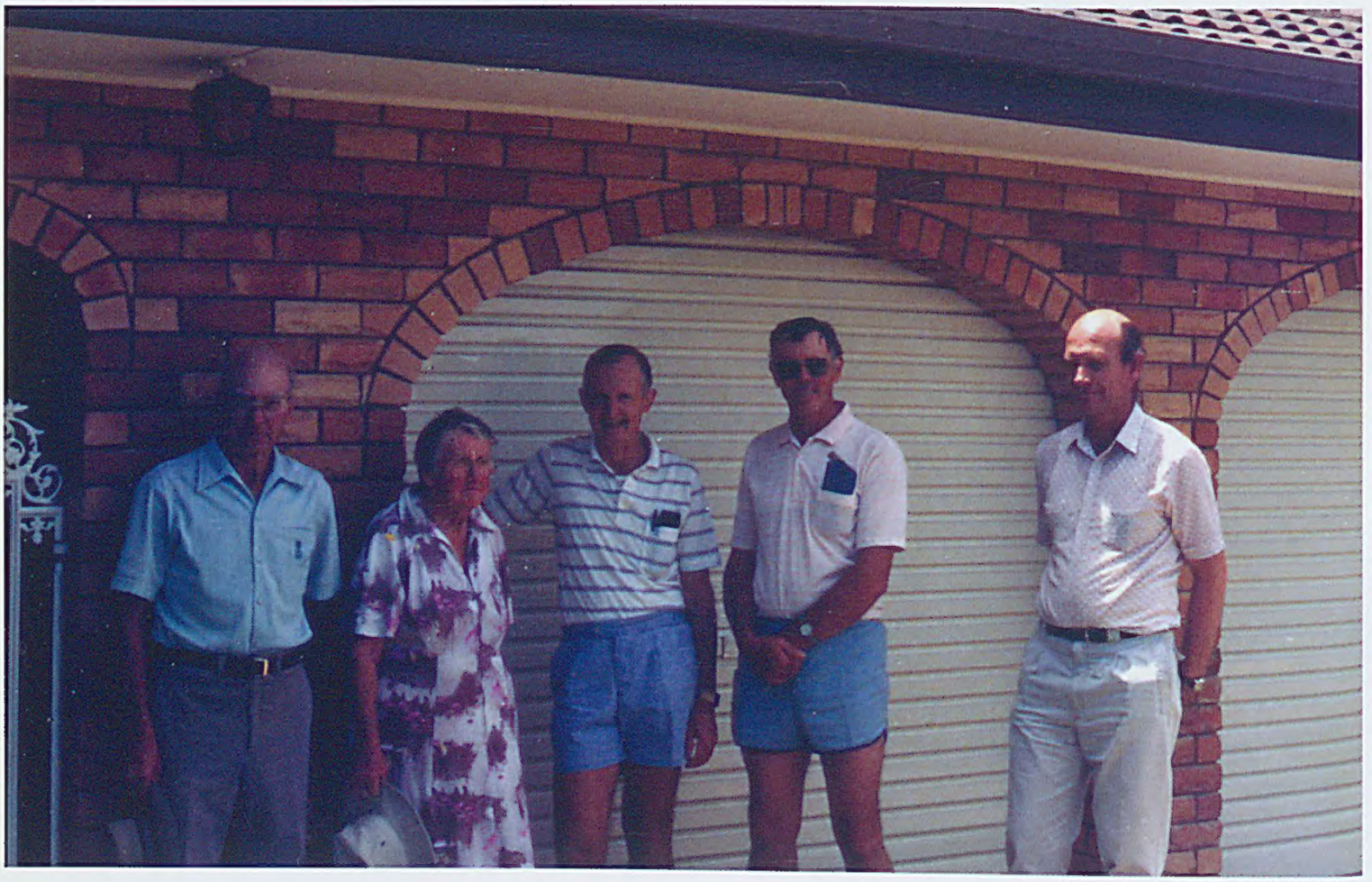
Jean was born in 1914 and grew up on a Macksville dairy farm in northern New South Wales. She grew cymbidiums from the age of 17 and is said to have had no initial interest in the local orchids. Bill was born in 1911 in Hampshire, United Kingdom. He was a builder by trade and had an interest in horticulture from childhood. He had various jobs during the depression in Australia before World War II, including work in building, sheep stations, wheat farms in the Mallee and as a strawberry picker in Victoria in the Silvan-Monbulk area. He served in the RAAF as ground staff during WWII and settled into professional horticulture in the 1950s.

Wayside Nursery

From Jean's account in *Twenty Five Years of Wayside Nursery* (Cannons 1982) the business was set up as an indoor plant nursery in the late 1950s. It was based in Gordon St. Port Macquarie and later moved to Fernhill Rd in the same area. Accurate records of their plants and breeding programs commenced in 1972 (Adams and Lawson 1995). Bill did his own flasking based on Knudsen's Media with green pod methods. Pollen was stored in glass jars with silica gel to use when other suitable parents flowered.

Bob Munro, a leading Wauchope grower and exhibitor of Australian orchids, worked full time at the nursery for several years in a variety of roles including deflasking and sales to Sydney. He supplied some plants from his collection for the breeding program and contributed to planning of crosses. Bob is still living in Wauchope.

In 1974 the Cannons moved to Mt. Tamborine where they concentrated on *Cattleya* breeding until ceasing operation in the early 1980s. Wayside Nursery was one of the very first Australian native orchid nurseries, when most nurseries were producing the more popular exotics. Their seedlings were widely distributed until the Port Macquarie nursery was taken over by George Hunter. They heavily



Group photograph at Macleay, New South Wales. Left to Right: Bill Cannons, Jean Cannons, Alan Garrett, Alwyn Flanagan, Harry Klose. Photo R. Graham

influenced later breeders such as Merrellen Orchids (Ted and Barbara Gregory), Orchid Glen Nursery (Ken Russell) and the Hasting Kingianum Growers Group (Harry Klose, Alwyn Flannagan, Alan Garrett, Rod Graham).

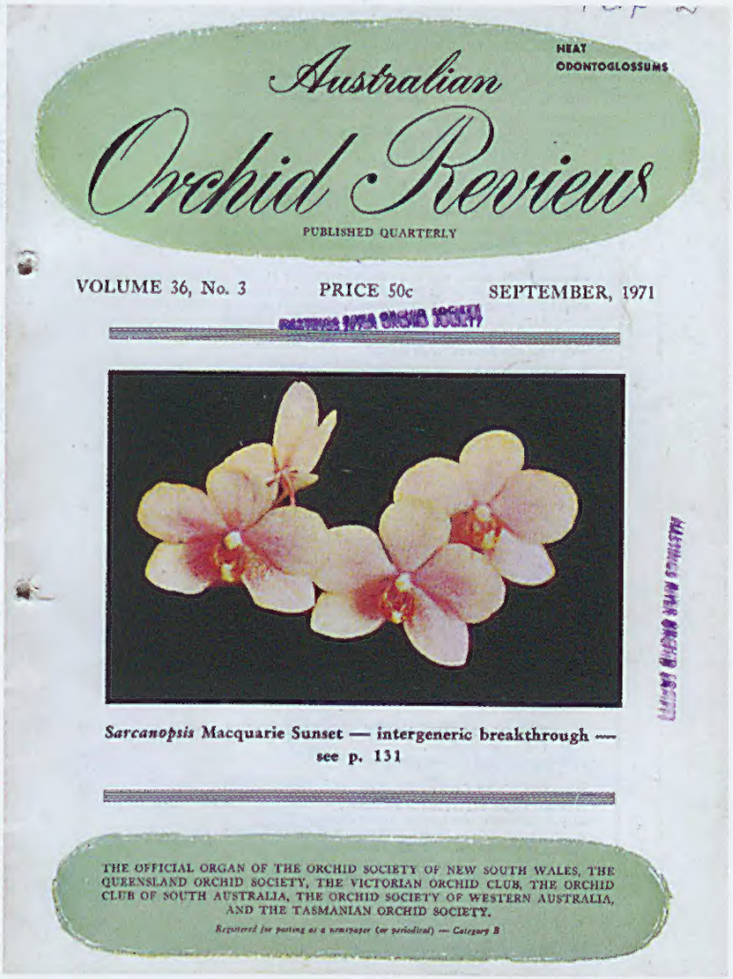
Dendrobium Hybrid Breeding

Bill Cannons had a keen interest in unusual and exotic orchids, and in experimental crossings between them (Alan Garrett pers. comm.). He imported show-quality cattleyas from the USA in the early years of the nursery and bred with them. He produced high quality seedlings of soft and hard cane dendrobiums, cattleyas and Australian dendrobiums which were exhibited to stunning effect in shows in the Hastings River/Port Macquarie area (especially the Hastings River Orchid Society) in the 1980s. There were specimen plants of *D. kingianum,* and early hybrids such as *D.* Delicatum and *D.* Bardo Rose worthy of quality awards but no judging panel was available. It was an inspiration for my family to begin a long association with Australian orchids and the growers of the Hastings River valley.

They also did remakes of *D.* Bardo Rose, *D.* Ella Victoria Leaney and *D.* Ellen, producing thousands of seedlings (D. Cannon pers. comm.). *Dendrobium* Ella Victoria Leaney made with three different *D. kingianum* resulted in three very different colour ranges, one being a bright purple-red. They also registered the hybrid *Cymbidium* Evonne (Esmeralda x *suave*) in 1973.

They registered only a few new Australian hybrids but their influence on hybridisation was substantial. Registrations included *D.* Hastings (1970), *S.* Weinhart (1970), *D.* Wonga (1979) and the very important *D.* Peewee (1979) (Table 1).

The details of the parents used for *D.* Hastings are not available. A remake of *D.* Hastings used *D. kingianum* 'Tunstead's Pink', a "pale pink beautiful *kingianum*", resulted in mainly pink flowers, whereas an earlier cross, possibly using *D. kingianum* 'Magenta', produced mainly mauve. *Dendrobium* Hastings was later crossed with a yellow *D. speciosum* from the Hawkesbury River to make the first *D.* Wonga. They also made the cross *D.* Peewee x *D. tetragonum* and planned to register it as *D.* Corella, but this name


Australian
Orchid Review
HEAT
ODONTOGLOSSUMS
PUBLISHED QUARTERLY
VOLUME 36, No. 3
PRICE 50c
SEPTEMBER, 1971
Sarcanopsis Macquarie Sunset — intergeneric breakthrough —
see p. 131
THE OFFICIAL ORGAN OF THE ORCHID SOCIETY OF NEW SOUTH WALES, THE QUEENSLAND ORCHID SOCIETY, THE VICTORIAN ORCHID CLUB, THE ORCHID CLUB OF SOUTH AUSTRALIA, THE ORCHID SOCIETY OF WESTERN AUSTRALIA, AND THE TASMANIAN ORCHID SOCIETY.

Australian Orchid Review Front Cover 36:3 1971

was used by Limberlost in 1961 for another hybrid (*D. aureicolor* x *D. phalaenopsis*). All the registered hybrids were later used in breeding programs. *Dendrobium* Peewee was used 45 times and the others more than ten times (Table 1).

The Cannons used *D. kingianum* as a parent for many crosses, using natural seedlings collected locally and beyond. These included 'Tunstead's Pink', which they regarded as the best of the species, and some of Bas Borger's collected plants which were from wider New South Wales. They also pioneered breeding with *D. speciosum* but the records are not available at this time.

Aeridinae Breeding

Within Aeridinae, the Cannons produced hybrids between *Sarcochilus hartmannii,* using selected 'Blue Knob' forms, crossed with several Asian genera after many attempts. Intergeneric hybrids at the time included *Sarcovanda*, *Sarcocentrum* (now subsumed under *Sarconopsis*) and *Sarconopsis*. *Sarconopsis* Macquarie Sunset created a great deal of interest and was featured on the cover of the *Australian Orchid Review* (AOR) in 1971 with an accompanying article written by Jean. There was great surprise that a cross between two species with so much genetic and geographic distance could be fertile, but there is no record available of how many attempts were made before it was successful.

The *Sarconopsis* hybrids registered in 1970 were a breakthrough in breeding for larger and longer lasting flowers. Jean described the value of using *Phalaenopsis* as a parent. "While many and varied hybrids could be produced within the range of Australian species.....any uplift could only be accomplished with the introduction of exotic species and hybrids" (1971).

It took eight years from 1963 to the Australian Orchid Review article in 1971. The first attempt was a cross of *Sarc. hartmannii* 'Blue Knob' with *Phalaenopsis schilleriana* which resulted in some seed capsules from many pollinations. The capsules were barely an inch long and only a few small seedlings were produced. They died when the town water supply became too saline in a dry spell.

In subsequent seasons many attempts were made with only a few seeds produced. When they were planted out they survived winter minimums down to -1°C and summer maximums up to 40°C. There was a period of dehydration when some plants defoliated or died. Eventually some seedlings grew well, and *Sarconopsis* Jean Cannons flowered. The plant had 10—12 flowers on the raceme, flowers were reportedly two inches in diameter, and lasted a month. This was followed by repeat flowering over five months.

Sarconopsis Macquarie Sunset results were even better, with blooms reportedly 2 ½ inches long, flowers a deep pink colour in the centre, and with 12-flowered racemes. It flowered continuously for eight months. *Sarconopsis* Macquarie Lilac flowered later, with flowers 2 5/8 inches diam., but with fewer flowers. It was considered less attractive in shape. Overall, very few plants were produced but the goals were achieved and noted worldwide.

The Hastings Kingianum Growers Group visited the Cannons every year to look at their latest results and discuss future breeding. Sheryl Lawson and I were included in the last such visit at Maclean in the mid-1980s where we discussed their breeding while

Dendrobium Peewee 'KWR#1' Photo D. Butler

Dendrobium Hastings Photo P. Adams

Dendrobium Golden Fleck Photo J. Cara

Dendrobium bigibbum var. *schroederianum* Photo P. Adams

Dendrobium Susan Photo D. Cannon

Dendrobium Hilda Poxon 'Red Star' Photo D. Butler

examining the records. The Cannons' collection of Australian orchids was passed onto the Gregorys and became part of the stock they used in future breeding lines.

Bill Cannon met Danny Bell while fishing at Maclean and when Danny expressed an interest in breeding, Bill offered to teach him flasking techniques. Danny went on to produce flasks for many years after Bill had completed the Cannons work on Australian orchids.

Wayside Nursery catalogues were produced in 1968, 1971, 1973 and 1974, and perhaps after this, but their interest in producing Australian orchids waned. Their catalogues included vandas, cattleyas, and soft and hard cane dendrobiums. Crosses included *D.* Delicatum 181 1ra Butler (IB), *D.* Bardo Rose 202 (1B), *D.* Ellen 13 (1B). Others were *D.* Suffusum, *D.* Hastings and *D.* Hilda Poxon 202 IB. Successful seedlings from *D.* Delicatum 181 included 'Kerry' (mauve) and 'Joybelles' (pale mauve).

George Hunter took over Wayside Nursery around 1977 and continued to produce and sell many Australian orchids after the Cannons moved to Mount Tamborine in southern Queensland.

Wayside Catalogues 1968—1974

A review of the Cannons catalogues produced in 1968, 1971, 1972 and 1974 showed that the breeding of Australian native orchids was minor compared with other genera, particularly show-bench cattleyas. However, the size of the list belies the influence they had on growing orchids in the local area around Port Macquarie, as well as in Sydney and Melbourne. Cool growing plants for "bush house culture", "hard-cane dendrobiums" and a small number of "native species" were listed (Table 2). The range of plants was narrow by today's standards but there were only a small number of hybrids being made and registered at that time.

The most fertile crosses were planted out in trays of one hundred or more (David Cannon pers. comm.), with many thousands of plants made in some crosses. The Cannons provided a flasking service to Ira Butler, and his crosses were also available in good supply. There were original Cannons crosses registered, unregistered and registered by others (Table 1), for example *D.* Golden Fleck and *D.* Hilda Poxon.

Two crosses listed have never been registered as far

Table 1. Registered hybrids by Bill and Jean Cannons.

Hybrid	Registration Year	Parents	No. Hybrid Progeny
Dendrobium Hastings	1970	*D. kingianum* x *fleckeri*	17
Sarcochilus Weinhart	1970 Cross made by B. Borger	*S. hartmannii* x *weinthalii*	11
Dendrobium Peewee	1979	*D. bigibbum* x *tetragonum*	45
Dendrobium Wonga	1979	*D. speciosum* x Hastings	19
Cymbidium Evonne	1973	*Cym.* Esmeralda x *suave*	
Sarcochilanthe Suzanne	1970	*S. hartmannii* x *Papilionanthe* Poepoe	
Sarcovanda Little Sue	1970	*S. hartmannii* x *Sarcovanda curvifolium*	
Sarconopsis Macquarie Lilac	1970	*S. hartmannii* x *Phalaenopsis* Federal Monarch	
Sarconopsis Jean Cannons	1970	*S. hartmannii* x *Phalaenopsis schilleriana*	
Sarconopsis Macquarie Sunset	1970	*S. hartmannii* x *Phalaenopsis* Aristocrat	

Table 2. A selection of *Dendrobium* hybrids from Wayside Nursery catalogues 1968—1972.

Hybrid	Parents as per catalogue	Comments
"Bush House Culture"		
Dendrobium Bardo Rose	*D. kingianum* x *falcorostrum*	Reg. Overall 1961
Dendrobium Ella V. Leaney	*D. kingianum* x *ruppianum* (*magnificum*)	Reg. D. Cannon 1980 *D. ruppianum* syn. *D. jonesii* var. *magnificum*
Dendrobium Ellen	*D. kingianum* x *tetragonum*	Reg. Schmidt 1928
(*Dendrobium* Golden Fleck)*	*D. fleckeri* x *gracilicaule*	Reg. D. Cannon 1980 (W. and J. Cannons)
(*Dendrobium* Gracious Cascades)*	*D.* Gracillimum x *speciosum*	Reg. D. Cannon 1982
(*Dendrobium* Hilda Poxon)*	*D. speciosum* x *tetragonum*	Reg. Grundon 1977 (W. and J. Cannons)
Dendrobium Hastings	*D. kingianum* x *fleckeri* Using *D. kingianum* 'Tunstead's Pink'	Reg. W. and J. Cannons 1970
Dendrobium Susan	*D. falcorostrum* x *gracilicaule*	Reg. Bedford 1970
Dendrobium Kingrose	*D. kingianum* x Bardo Rose	Reg. Butler 1966
Dendrobium Specio-kingianum	*D. speciosum* x *kingianum*	Reg. Lawrence 1892
Dendrobium Suffusum	*D. kingianum* x *gracilicaule*	hort. 1964
-	*D.* Willowie Gold x *kingianum*	Unregistered
Sarcochilus Fitzhart	*S. hartmannii* x *fitzgeraldii*	Reg. Butler 1963
"Hard Cane *Dendrobiums*"		
	D. compactum x *schroederianum*	= *D. bigibbum* Intervarietal.
	D. schroederianum 'alba' x 'alba'	= *D. bigibbum* var. *schroederianum*
	D. D'Albertsii (syn. of *D. antennatum* var. *d'albertisii*) x *williamsianum*	Unregistered
"Native Species"		
	Dendrobium kingianum 'alba' x 'alba'	
	Sarcochilus hartmannii 'Blue Knob variety' x self	
	D. ruppianum 'Magnifica'	*D. jonesii* var. *magnificum*
Other "Native Hybrids"		
	D. Willowie Gold x *kingianum*	Hybrid unregistered.

*Hybrid name not used in catalogue. Some catalogue names have been corrected.

as I can determine. They are *D.* Willowie Gold x *D. kingianum* and *D. antennatum* (as *D. D'Albertsii*) x *D. williamsianum.*

There were a limited number of Australian species listed in this period, although it is reported that the Cannons did crosses of *D. kingianum* and *D. speciosum* and these may be listed elsewhere. *Dendrobium* Bardo Rose, *D.* Ellen, *D.* Suffusum, *D.* Ella Victoria Leaney and *D.* Golden Fleck must have been popular as they were remade and appear in all catalogues.

Dendrobium Golden Fleck is rarely seen today. It was described as yellow with larger flowers than the parent *D. gracilicaule.* I have searched with difficulty for plants of this cross for two years, locating a small number. I consider that they have potential for breeding more intense yellow and green flowers.

In the list of hard cane dendrobiums there were seedlings of *D. bigibbum* crossed with exotic *D. bigibbum* hybrids (not listed in Table 2) and other seedlings that today would be regarded as inter- and intra-varietal *D. bigibbum.*

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LAELIINAE

WS-438. *Epidendrum mariae* x C. Little Angel. A charming Epi species with chartreuse and white flowers crossed with a waxy white bifoliate. 2" pot size $1.50.

WS-234. *Cattleya intermedia* x Self. A good form. 2" pot $1.50.

WS-235. Laelia Latona x SL Psyche. A bright yellow Laelia mated with a small growing Psyche, likely to produce clusters of bright orange flowers. 2" pot $1.50.

WS-311. (C. Barbara Billingsley x *L. cinnabarina*) x B. Glauca. Should be a most interesting BLC. 2" pot $1.50.

WS-293. *Cattleya bowringiana* var. *amethystoglossa*, selfed. A beautifully coloured cluster Cattleya popular with everyone. 2" pot $1.50.

WS-331. L. cinnabarosa x L. Latona. Rich yellow to orange flowers expected. 2" pot $1.50.

WS-230. *C. harrisoniana* var. *alba* x *C. mossiae* fma. *wagneri*. A very hardy white bifoliate with *C. mossiae* fma. *wagneri* should produce vigorous whites. 2" pot $1.50.

F-63. LC Charlesworthii x *L. milleri* (best). This *L. milleri* is a very fine form. The flowers are larger than usual with round petals of bright vermillion red. The LC Charlesworthii is a tomato red and a proven breeder. 2" pot $1.50.

F-163. *L. cinnabarina* fma. *Fuch's* x *L. harpophylla* fma. *Stacy's* AM/AOS. Remake of L. Coronet. Expect extra large flowers of clear orange. Both parents quite select. 2" pots $1.50.

F-111. *C. elongata* x LC Twinklestar. A much darker approach to a type of flower as C. Rembrandt (*C. elongata* x *C. labiata*) which should prove a real charmer with dark red flowers. 2" pot $1.50.

F-151. *C. guatemalensis* x LC Charlesworthii. Many colourful flowers of bright coral red can be expected. 2" pot $1.50.

F-122. *L. flava* var. *glossoniana* x *Sophronitis grandiflora*. Remake of SL Marriottiana. Flat, well shaped flowers of clear vermillion to orange on a petite plant. 2" pot $1.50.

F-191. C. Empress Bells 'Regal Ring' x *L. rubescens* var. *alba*. Should be an attractive novelty with many white flowers. 2" pot $1.50.

F-110. *C. guttata* cv. 'Dark' x LC Charlesworthii. Many flowers of dark red-bronze with good substance. 2" pot $1.50.

WS-31. *C. intermedia* var. *alba* cv. 'Casa Luna' x self. A hardy and very floriferous white bifoliate. 4" pot $2.50.

WS-162. *C. forbesii* x *C. mossiae* fma. *wagnerii*. Yellow-green cluster crossed with a large white. 4" pot $2.50.

WS-119. *C. intermedia* x (*C. mossiae* x C. Profusion 'Cadycse'). Should produce colourful well shaped purple clusters. 4" pot $2.50.

WS-153. *C. forbesii* x *C. bowringiana* var. *amethystoglossa*. A medium sized yellow-green flowered cluster type crossed with a good form of popular C. bowringiana. 4" pot $2.50.

WS-44. *C. intermedia* x *L. amoena*. A strong growing hybrid. Flowers of lavender with dark lip should predominate in this cross. A very good beginner's orchid. 4" pots $2.50.

NATIVE HYBRIDS

Magnificent premium-type parents. Most of the hybrids already flowered have proved better than the parents.

WS-257. D. Bardo Rose. Outstanding types of *D. kingianum* and *D. Falcorostrum* used as parents. 2" pot 75c. 4" pot $1.50.

WS-252. D. Gracillimum. From a short cane D. speciosum and a beautiful D. gracilicaule. 2" pot 75c. 4" pot $1.50.

WS-189. D. Suffosum. Flowerings of this cross between *D. kingianum* and *D. gracilicaule* last season proved outstanding. 4" pot $1.50.

SOFTCANE DENDROBIUMS

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Anne Marie No. 10 x Anne Marie No. 2.

Madel 'Magnifica' x Anne Marie No. 25.

Some of the above in short supply. When ordering please give second preference.

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Wayside Nursery Catalogue, *Australian Orchid Review* March 1967

Native Dendrobium Hybrids

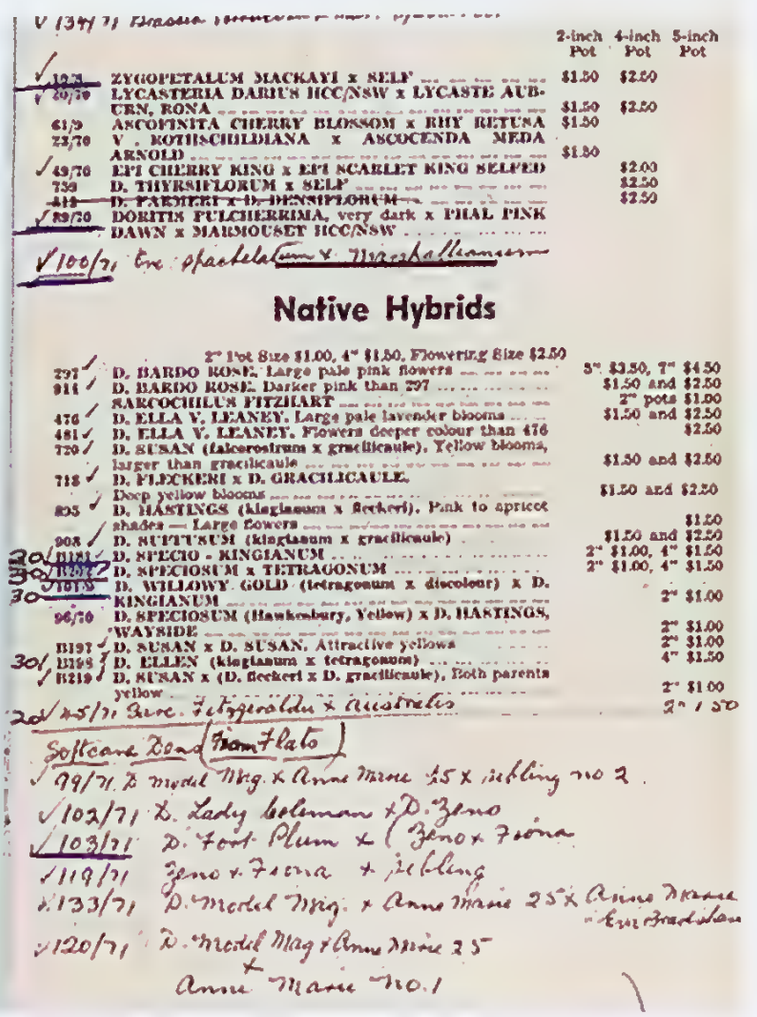
SELECTED PARENTS SUITABLE FOR BUSH HOUSE CULTURE	2-inch Pot	4-inch Pot	5-inch Pot
WS-257 D. BARDO ROSE (D. Kingianum x D. Falcorostrum) Large flowers—colours pale to dark pink		$1.50	$2.50
WS-252 D. GRACILLIMUM (D. Speciosum (Short Cane) x Gracilicaule)		$1.50	$2.50
WS-189 D. SUFFUSUM (D. Kingianum x D. Gracilicaule)		$1.50	$2.50
WS-10 D. SUFFUSUM (D. Kingianum x D. Gracilicaule Var. Howianum)		$1.50	$2.50
WS-295 D. KINGIANUM x D. BARDO ROSE		$1.50	$2.50
WS-476 D. KINGIANUM "Wayside" x D. RUPPIANUM Magnifica	75c.	$1.50	$2.50
WS-481 D. KINGIANUM, Magenta x D. RUPPIANUM, Mag	75c.	$1.50	$2.50
WS-467 D. ELLEN (Large Tetragonum x Kingianum)		$1.50	$2.50
WS-311 D. KINGIANUM, Alba x D. FLECKERI	75c.	$1.50	
WS-718 D. FLECKERI x D. GRACILICAULE, Howianum	75c.	$1.50	
WS-720 D. FALCOROSTRUM x D. GRACILICAULE, Howianum	75c.		

Native Species

	2-inch Pot	4-inch Pot	5-inch Pot
D. KINGIANUM		$1.00	$1.50
WS-518 D. RUPPIANUM, Magnifica		2" pots 75c.	
WS-580 SARCOCHILUS HARTMANNI (Blue Knob variety) x Self			
Small seedlings		2" pots 75c.	

Hardcane Dendrobium Seedlings

	2-inch Pot	4-inch Pot	5-inch Pot
WS-158 D. DALBERTSH x D. WILLIAMSIANUM		$2.50	$3.50
WS-460 D. (D. LADY HAMILTON x D. HELEN FUKEMURA) x D. MAUI BEAUTY	$1.50	$2.50	
WS-435 (D. HELEN FUKEMURA (dark) x D. LADY FAY (dark) x D. MAUI BEAUTY	$1.50		
WS-423 D. LADY HAMILTON, Top Hat x D. PHAL Dixon	$1.50		
WS-463 D. MAUI BEAUTY x (D. NOA TAM x D. LADY HAMILTON)	$1.50		
WS-406 D. PHAL Dixon x D. BLACK MOUNTAIN	$1.50		
WS-416 D. COMPACTUM (Pale) x D. SCHRODERIANUM (Bicolour)	$1.50	$2.50	
WS-417 D. COMPACTUM (x D. PHAL FCC/RHS x D. LADY FAY "Akia" AM/RHS	$1.50	$2.50	
WS-458 D. (WHITE CAESAR x D. MAUNA KEA) x D. HELEN FUKEMURA x D. LADY FAY	$1.50		
WS-412 (D. PHAL. FCC/RHS x D. LADY FAY "Akia") x (D. ENDEAVOUR x COMPACTUM)	$1.50		
WS-414 (D. PHAL. FCC/RHS x D. LADY FAY, "Akia" x COMPACTUM	$1.50		
WS-495 D. SCHRODERIANUM ALBA x D. SCHRODERIANUM ALBA	$1.50	$2.50	
WS-650 D. AMETHYST x D. LADY HAMILTON, Dark Ball			


2-inch Pot
4-inch Pot
5-inch Pot
ZYGOPETALUM MACKAYI x SELF' $1.50 $2.50
LYCASTERIA DARIUS HCC/NSW x LYCASTE AUBURN, RONA $1.50 $2.50
ANCOFINITA CHERRY BLOSSOM x RHY RETUSA $1.50
V. ROTHSCHILDIANA x ASCOCENDA MEDA ARNOLD $1.50
EPI CHERRY KING x EPI SCARLET KING SELF'ED $2.00
D. THYRSIFLORUM x SELF' $2.50
D. PARISHII x D. DENSIFLORUM $2.50
DORITIS PULCHERRIMA, very dark x PHAL PINK DAWN x MARMOUSET HCC/NSW
Native Hybrids
2" Pot Size $1.00, 4" $1.50, Flowering Size $2.50
297 D. BARDO ROSE. Large pale pink flowers 3" $3.50, 7" $4.50
814 D. BARDO ROSE. Darker pink than 297 $1.50 and $2.50
SARCOCHILUS FITZHART 2" pots $1.00
476 D. ELLA V. LEANEY. Large pale lavender blooms $1.50 and $2.50
481 D. ELLA V. LEANEY. Flowers deeper colour than 476 $2.50
720 D. SUSAN (falcorostrum x gracilicaule). Yellow blooms, larger than gracilicaule $1.50 and $2.50
718 D. FLECKERI x D. GRACILICAULE. Deep yellow blooms $1.50 and $2.50
805 D. HASTINGS (kingianum x fleckeri). Pink to apricot shades — Large flowers $1.50
903 D. SUPERBUM (kingianum x gracilicaule) $1.50 and $2.50
D. SPECIO - KINGIANUM 2" $1.00, 4" $1.50
D. SPECIOSUM x TETRAGONUM 2" $1.00, 4" $1.50
D. WILLOWY GOLD (tetragonum x discolour) x D. KINGIANUM 2" $1.00
96/70 D. SPECIOSUM (Hawkesbury, Yellow) x D. HASTINGS, WAYSIDE 2" $1.00
B197 D. SUSAN x D. SUSAN. Attractive yellows 2" $1.00
B198 D. ELLEN (kingianum x tetragonum) 4" $1.50
B219 D. SUSAN x (D. fleckeri x D. gracilicaule). Both parents yellow 2" $1.00
Softcane Dendrobiums
99/71 D. Madel Mag. x Anne Marie 25 x sibling no 2.
102/71 D. Lady Coleman x D. Zeno
103/71 D. Fort Plum x (Zeno x Fiona
119/71 Zeno x Fiona + sibling
133/71 D. Madel Mag. x Anne Marie 25 x Anne Marie
120/71 D. Madel Mag x Anne Marie 25 x Anne Marie No. 1

Wayside Nursery Catalogue 1968

49/70 Epi. CHERUB'S KING × Epi. SCARLET KING $2.00
Large flowers, orange to red.

NATIVE HYBRIDS

Most of the native hybrids listed will flower during September this year. Prices are as follows.

4" pots $2.00. Larger plants in 4" & 4½" pots $2.50.
5" pots $3.50. Few larger plants $4.00.

476 & 481.	D. BILL V. LEANEY	$2.50 size only.
718	D. FLECKERI × D. GRACILICAULE	$2.50 & $3.50. (Stocks Limited)
695	D. HASTINGS	$2.00, $2.50 & $3.50
B101	D. SPECIO - KINGIANUM	$2.50 & $3.50
B202	D. SPECIOSUM × D. TETRAGONUM	$2.00, $2.50 & $3.50
S6/70	D. SPECIOSUM × D. HASTINGS, WAYSIDE	$2.50
B198	D. ELLEN	$2.50 & $3.50

1974

Wayside Nursery Catalogue 1974

David Cannon and the Cannons

David Cannon from Victoria (no relation of the Cannons) purchased many trays of Australian hybrids from the Cannons, including crosses made by Ira Butler, and developed his own breeding program which continues to the present. He undertook the 15-hour drive from Melbourne to Port Macquarie, sleeping in his car until the morning and joining the Cannons for breakfast. He was introduced to Ted and Barbara Gregory there, the start of a long relationship. On one occasion, David described purchasing 6000 seedlings in trays (flats). A single tray would hold 100 seedlings, some for reselling. He required a permit to transport them back to Victoria and carried them in the back of his station wagon, which was modified to carry two levels of trays. He showed the permit for 6000 plants at the border where the official told him "I'm not going to count them, just go on".

David obtained plants of *Sarconopsis* Macquarie Sunset and Macquarie Lilac (spelt MacQuarie in the Royal Horticultural Hybrid List). In 1985 he took a raceme of *Sarconopsis* Macquarie Sunset to the London Centenary Orchid Conference where he spoke on Australian orchids. The raceme was quickly noted, and he was requested to put it before the Royal Horticultural Society for judging, as it was a spectacular exhibit and judges had not seen anything like it. It was awarded AM/RHS and a certificate was presented to him, together with an original painting by the RHS Official Artist of one flower.

The hybrids required considerably warm growing conditions to survive in Victoria and were most likely lost. David used the Cannons' plants in his breeding, for example, *D.* Ellen 'Snowwhite' in crosses with *D. falcorostrum* to make *D.* Warrambool and a white *D.* Delicatum from Dos Pueblos to make *D.* Delicate Ellen. Most of the seedlings flowered white with a purple labellum.

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Sarconopsis Macquarie Lilac Photo D. Cannon

Sarconopsis Macquarie Sunset Photo D. Cannon

Sarconopsis Jean Cannons Photo D. Cannon

Cannons J 1982 Twenty-five years of 'Wayside Nursery'. *6th New South Wales Regional Conference.* Hastings River Orchid Society.

Klose H 1987 The Red Revolution. *6th New South Wales Regional Conference.* Hastings River Orchid Society.

Acknowledgements

Alan Garrett and Harry Klose provided information and contacts for this article. Greg Elliot supplied copies of historical documents and the group photograph. David Cannon contributed verbal history.

Lifespan, Flowering and Reproductive Success of *Caladenia behrii* Schltdl. in Belair National Park, South Australia

Text and Photos Leo Davis | leordavis@adam.com.au

Abstract

Monitoring of an isolated population of *Caladenia behrii* Schltdl. has shown that small numbers of individual plants can survive for at least 19 years from first flowering and hence perhaps for 23 years or more from seed. A small proportion of plants flowered for five or more consecutive years with one plant observed flowering for 13, and another for 12, consecutive years. Over observation periods from 10–19 years most individuals fell into dormancy for a year one or more times, very rarely for two years, to return as a leaf or a flowering plant. Natural pollination of flowers occurs at a variable rate, suggesting the presence of appropriate insect pollinators. Natural replacement from seed occurred at an average rate of about 2% of current plants per year, measured over the most recent ten years. Simple counts of flowering plants over time are likely to represent only a part of the population.

Introduction

A tiny population of the endangered South Australian endemic *Caladenia behrii* (pink lip spider-orchid) exists in Belair National Park in the Mount Lofty Range east of Adelaide. This population is separated from the main strongholds of the species to the north and north-west of Kersbrook. The author was unaware of the occurrence at Belair before 19th August 2011, when he was asked to meet Jenny Skinner at the population location. She explained that Joe Quarmby, then of the Department for Environment, Water and Natural Resources (DEWNR; now Department for Environment and Water/DEW), had carried out caging of plants at the site in 2002 or earlier, and that she, at that time an active Friend of the Belair National Park, had been monitoring the plants and reporting results to Quarmby for several years. As Skinner was relocating to Tasmania, the author agreed to take over the monitoring role. Data was collected from 2011–19 and a report published (Davis 2019). In July 2020 the author was given access to data collected by Quarmby and/or Skinner from 2002–10. It was possible to correlate plants from the two sets of data because, when Quarmby, assisted by Ed Lowery and the author, changed pin numbers on 30th August 2013, the author recorded old and new pin numbers. However the author cannot vouch for data collected before 2011 (see heavy line separating data on Table 1). This paper reports on the data described in 2019 with the addition of the data from 2002–10 and fresh data from 2020.

Monitoring

There are now 22 wire cages, variably up to approximately 80 cm high, each individually labelled (A, B1, B2, B3, C, …, S) and located by GPS record. Cages have contained, over time 1–19 plants of *C. behrii* (although in at least five cages there are now none). There are much greater numbers of *C. tentaculata* growing around and between the *C. behrii*, as well as a lesser number of specimens of *C. leptochila*, all with similar leaves, which makes certain identification at leaf stage all but impossible.

Around 60 plants protected in cages have been verified over 19 years as being *C. behrii* by having produced at least one flower. Most cages were installed before 2011. The author and another volunteer, Ed Lowery, have repaired or replaced several and installed others at six locations where new plants have been found.

Skinner, and later the author, kept records of each plant using data sheets that Quarmby produced. For each plant, stages of growth (leaf, bud, flower, seed capsule) were observed and recorded.

Results

Records for a selection of the most consistently flowering of the approximately 60 remaining

Habitat at study site, Belair National Park showing several cages in situ.

Caladenia behrii Belair National Park

Example of cage at Belair National Park. Damage may be due to kangaroos, follwed by repairs and reshaping.

Table 1: Emergence and flowering of nine plants of *Caladenia behrii*.

Year: 20## / Cage-Pin.	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
B2-12a	-	-	-	-	-	-	-	-	F	F	F	B	F	F	F	C	C	L	C*
E1-25	-	-	-	F	L	F	F	L	F	F	C	B	C	C	C*	NE	C*	C	NE
F-32	C	L	F	C	F	C	L	L	L	F	F	B	F	F	C*	F	C	Lost	Lost
G-33	F	NE	NE	F	L	NE	F	C	L	F	F	L	C	F	L	L	C*	F	L
J-36	-	-	-	-	-	C	L	F	F	F	F	B	NE	C	F	NE	L	NE	C
K-37	-	-	-	-	-	C	L	C	L	F	C	B	F	L	L	NE	NE	L	NE
M-39a	-	-	-	-	-	C	L	F	F	F	C	C	F	C	C*	F	C*	C	C*
M-39b	-	-	-	-	-	L	F	F	F	F	C	C	F	F	F	F	C*	C	C*
P-41a	-	-	-	-	-	-	-	-	-	F	F	B	L	F	F	L	L	C	NE

The lost plant was in a cage that was knocked over, presumably by a kangaroo, and its exact location is not yet re-established. Theft is also possible; this plant was isolated and out of sight of all others and the numbered pin is missing.

Key

NE		Plant did not emerge.
L	Leaf	Indicates a leaf that did not go on to produce a bud, flower or capsule that year.
B	Bud	Only a bud was observed; it probably went on to flower, or even to fruit, later than the observation.
F	Flower	A flower (including aborted or eaten); it may have fruited later than the observation.
C	Capsule	Mature seed capsule naturally pollinated. Some hand pollination was likely in 2019.
C*	Capsule	Mature seed capsule produced after hand pollination.
-		Plant not known in these years

plants are shown in Table 1. Individual plants are referenced to numbered location pins (e.g. 5 cm N; 11 cm 130°, with sometimes two or more plants referenced to the same pin) so that individual plants could be tracked over the years. In Table 1, 'B2-12a' indicates the first of two plants in cage B2, referenced to pin TFE012, while 'P-41a' indicates the first of several plants referenced to pin TFE041, in cage P. In cages that protect many plants it is possible that identification of individuals was not accurate year to year. Plants recorded in Table 1 were single plants (e.g. F, G, J, K) or easily distinguished from others in the cage (e.g. M, P).

The observations in early years are of flowering plants only. At that stage non-flowering leaves could not be identified. This led to the appearance that 100% of plants flowered. In time, identified plants appeared in succeeding years as leaves only, leading to more realistic flowering rates, but it seems that leaves were not counted every year. Records of plants appearing only as leaves in later years are more reliable. The percentage of identified emergent plants seen to flower is calculated over the nine years when the author was responsible for observations. It is possible that some undocumented hand pollination occurred in 2000–2010.

Plant F-32 was observed as a flowering plant or a leaf for 17 consecutive years before being lost from an unknown cause in 2019. Plant G-33 was observed most years (10 years as a flowering plant, six years as a leaf and not observed in three years) over 19 years. Two plants (M-39a and M-39b) flowered for

Table 2. *Caldenia behrii* flowers and capsules produced by insect or hand pollination in Belair National Park 1998—2020.

	Flower, bud or capsule production	Capsule set	Total plants including leaves	% plants flowering	Seed capsules from insect pollination		Seed capsules from hand pollination	
Year					No. plants	% of flowers	No. plants	% of flowers.
1998	3	0	3	-	-	0	-	-
1999	-	-	-	-	-	-	-	-
2000	7	3	7	-	3	43	-	-
2001	6	3	8	-	3	50	-	-
2002	7	3	14	-	3	43	-	-
2003	8	4	14	-	4	50	-	-
2004	11	4	13	-	4	36	-	-
2005	12	2	17	-	2	17	-	-
2006	10	0	20	-	0	0	-	-
2007	27	9	29	-	9	33	-	-
2008	15	1	30	-	1	7	-	-
2009	16	6	26	-	6	38	-	-
2010	15	2	34	-	2	13	-	-
2011	21	1	21	-	1	15	-	-
2012	19	3	38	50	4	19	-	-
2013	25	2	40	63	2	8	-	-
2014	27	7	49	55	7	26	-	-
2015	32	11	35	91	11	34	-	-
2016	35	6	45	78	0	0	6	100
2017	18	5	35	51	5	28	-	-
2018	19	17	52	37	10	83*	7	100
2019	21	11	38	55	11*	52*	??	??
2020	12	7	24	50	2	29	5	71

*In at least these three years some flowers were hand pollinated using widely separated plants

13 years out of 14 consecutive appearances, with M-39b flowering for 13 consecutive years. Overall, 13 plants flowered for six or more consecutive years.

Plants regularly survive underground as a dormant replacement tuber for one year, reappearing as leaves or flowering plants. Dormancy of two, or even three, years may have been observed, but identification of plants was not certain in crowded cages.

Only 12 new flowering plants (in new cages B3, O, P, Q, R, S) of a current total of about 60 have been observed by the author over ten years up to 2020, and some of these have not been observed in one or more of the years 2018, 2019 and 2020. Some leaves of putative plants have yet to flower and may be verified in future. This represents an average recruitment rate of less than 2% of existing plants per year. A total of 10 tiny leaves were observed at the base of existing plants in 2020 (eight around M-39a & M-39b) giving hope that hand pollination may be enhancing population size.

Table 2 records rates of flowering and seed capsule production from 1998–2020.

Discussion

Dixon and Tremblay (2009, p248) reported that, in general, plants of *Caladenia* can first flower in their fourth season. Hence plants first recorded as flowering in 2002 were likely to have already been four years old or more when first recorded, suggesting ages of 23(19 + 4) years and

21(17+4) years or more for plants G-33 and F-32.

That 13 plants flowered for six consecutive years or more (one each for 12 and 13 years) is exceptional, given the report of Tremblay et al. (2009 p 351), who studied nine species of *Caladenia* in the section of the genus commonly known as spider orchids. They concluded that the probability of individuals flowering in two consecutive years is extremely rare. It seems that *C. behrii* behaves more like *C. amoena* that Tremblay et al. (2019) report as the only one of their studied species to show flowering in consecutive years. They further reported that 'all other species had a high likelihood of returning to a vegetative state, and some were likely to enter dormancy after flowering.'

Plants may have reappeared after two or three years dormancy, but this was not observed with certainty and this is in line with Dixon and Tremblay (2009 p340) that dormancy of three or more years was extremely rare (<2%).

When hand pollination was undertaken (always using donor and receptor flowers from as far apart as possible), it had a 100%, 100% and 71% success rate. Natural pollination occurred with between 8% and 34% success rate measured across six years. The 83% natural pollination success rate in 2018 seems highly anomalous and may indicate unreported hand pollination, possibly linked to official capsule collection. The 52% 'natural' pollination rate in 2019 also suggests that some hand pollination was carried out. All 11 mature capsules observed on 6th October had disappeared on 9th November, presumably collected for seed.

No instance of two plants or more appearing at or near one location was observed (as does happen in many orchid genera including some *Caladenia* species), suggesting that only one replacement tuber is produced each year. It is assumed, but not confirmed, that each reappearing plant arises from a replacement tuber produced by the plant, below the current tuber, as described by Dixon and Tremblay (2009, p248).

The total number of individuals in the population is not possible to determine. Of a possible current population of around 60 plants (those that have not been dormant for more than two years), 39 appeared in 2019, with 21 going on to flower and 10 of these produced fruit. In 2020, 24 plants emerged, 12 of which flowered, so that of plants presumed to be still living, 54% and 40% have emerged in the last two years. The flowering plants in those years made up 55% and 50% emergent plants and were respectively about one third and one fifth of known verified plants.

Conclusion

A few individual plants of *Caladenia behrii* can persist for up to 19 years and most likely for up to 23 years and perhaps beyond. While two plants have been observed flowering for 12 and 13 consecutive years and a few for five or more consecutive years, few plants flower every year. Most plants spend at least one year dormant one or more times in their life cycle over a nine-year observation period. Natural pollination is occurring with between 8% and 34% success rate measured across nine years (2012–2020) suggesting that appropriate pollinators are active.

For census purposes, a count of observed flowers in this species, in the absence of confident identification of leaves, is not an accurate measure of population size. A flower count may indicate a little over half the number of plants emerging that season. The total population, including tubers lying dormant, could be three to five times the flower count.

Acknowledgements

In recording data, protecting and caging plants, and collecting seed of several rare orchid species at about a dozen locations over ten years, the author has appreciated the encouragement, collaboration and good company of Ed Lowery, Helen McKerral, Joe Quarmby (DEWNR), Dr Richard Davies (DEWNR, DEW), Thelma Bridle, Clive and Claire Chesson, and Tim Jury. This publication of results and their analysis was only possible because of the far-sighted initiative of Joe Quarmby who set up the detailed recording of observations for this species.

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Leo Davis was a secondary school teacher of physics, biology and psychology for 45 years. He has monitored ten species of threatened orchids for up to ten years, and more recently assists in seed collection projects and studies of the effects of controlled burns on terrestrial orchids.

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The Skill of Artful Neglect: Confessions of a Novice Grower

Text and Photos Matt A.M. Renner | matt.renner@rbgsyd.nsw.gov.au

Introduction

The fervor with which new growers take to orchids is often spoken of in terms of affliction. A bad case of 'the bug' demarcates the beginning of, with luck and good management, an incurable episode of learning and fascination capable of bringing a great deal of satisfaction and indeed joy. For the newly afflicted, fervor is often blinding to good practice. Many precautionary words have been written by experienced growers to help avoid the disappointment, nay heartbreak, encountered by those who let enthusiasm trump their experience. After six years back in Australia and three in my own home where I have been able to re-indulge a passion, I now fall into this unfortunate category. This missive is my redundant attempt to temper the truism that wanting is not so great a thing as having, and the derivative adage that you can never have enough orchids. It is really a plea to other novice growers to not repeat the many mistakes that I have made over the past six years. That I had, over those years, read for myself much advice contrary to my actions I hope justifies this restatement.

Beginning

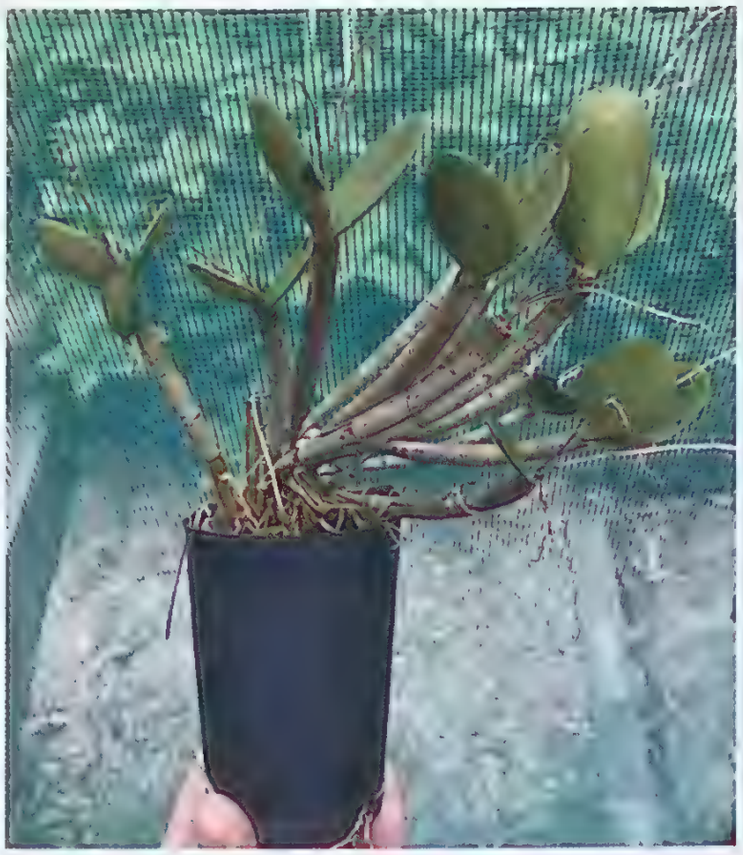
Start small-in-number with large-in-size plants. You will gain more immediate satisfaction from larger plants, which are also more robust to cultural trial and error. Acquire new plants slowly. Don't get ahead of your capacity to expand your growing space accordingly and your discipline to quarantine appropriately. Bench your plants well. Keep them off the ground.

Acquire new plants from other local growers who cultivate them in conditions similar to your own. These plants will be best suited to your growing environment. Join a local society to achieve this. Talk to members about what works for them and what doesn't. The value of this dialogue cannot be overstated. If you can, by virtue of invitation or participation in a foray, take the opportunity to visit other local growers to see how they do it and what works for them. Growing orchids is all about growing orchid roots. Pay particular attention to the mixes that other local growers use, how often they water their plants and how often they fertilize, with what and at what strength. Imitating success is the easiest path to success.

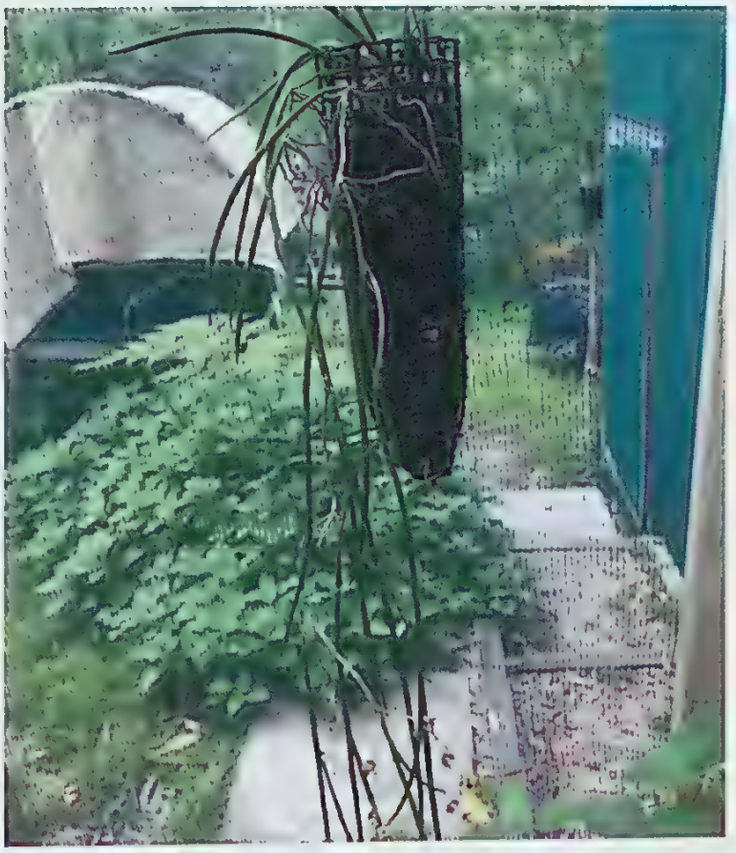
Keep a register of your orchids. Give each its own unique number. Be meticulous with your labeling and record keeping. Don't abbreviate names. Don't drop the "x self" if it is. Don't trust your memory to remember what a plant's name is, where you got it and when. You won't remember them all. An orchids legacy increases the value of the plant as it ages. Seedlings of Schmidt's *Dendrobium* Ellen still exist in collections today, and have accumulated a relatively long list of cultivators, many notable. Being able to eventually pass this sort of legacy on has its own unique satisfaction. Plants like these are antiques, have cultural significance, and can be prized for their legacy.

Pests and Diseases

Maintain two physically separate growing areas. Use one as quarantine. Retain new plants in the quarantine area for at least one growing season. Some diseases can remain hidden for long periods. Scale crawlers, if present, are effectively invisible. They are mobile, will be dispersed by water splashing, and the last thing you need is a boisduval scale outbreak in your collection. Bacterial brown rots can arrive on asymptomatic plants. The bacterial spores are resilient and capable of surviving up to 60 days in favorable environments before infecting plants and causing an outbreak. They can spread rapidly via streaming from infected tissue and overhead watering with its associated splashing. Save yourself the trouble of trying to eradicate this.



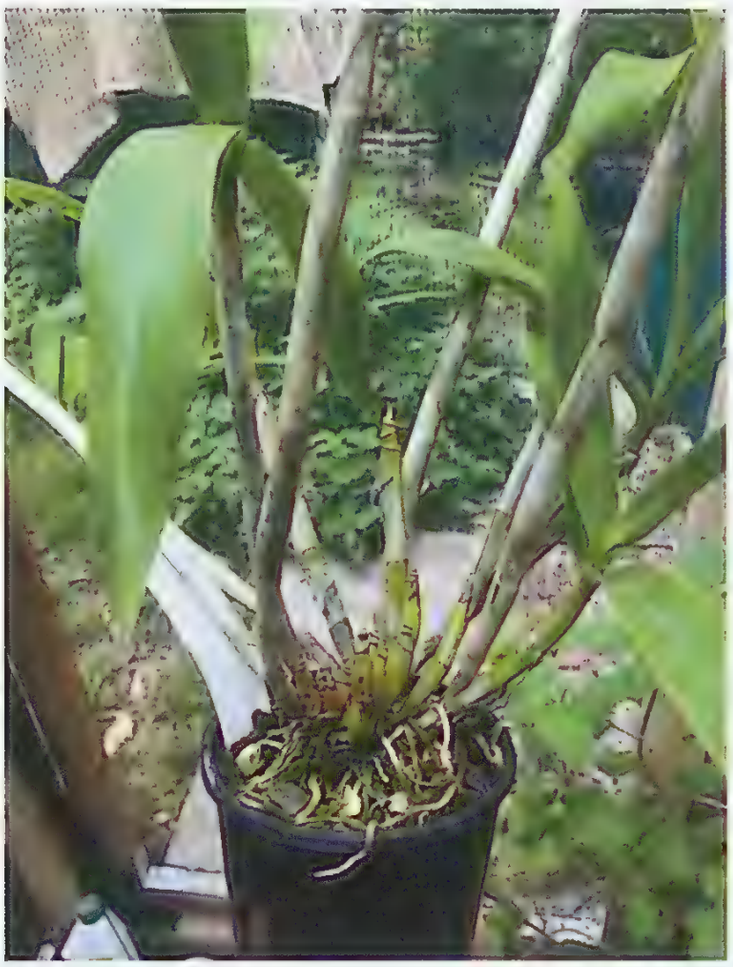
Dendrobium aemulum growing in a pot. There's an adage that this species is unable to grow in pots, but if you find the chunkiest, hardest pine bark you can, hold off repotting, and lime a little, you'll keep them alive and growing. This one is in its ninth year in a pot with me, and I've repotted once in that time. Note the bacterial spotting I'm struggling with, despite the copper.



Dendrobium sect. *Rhizobium* can be grown many ways, in pots, on mounts, or somewhere in between as with the gutter guard - pine bark combination seen here. This keeps plenty of air around the free-roaming roots, and reduces incidence of rhizome and root rot compared to my pot grown plants.

I've never seen *Dendrobium lichenastrum* on tree fern in the wild, but in cultivation it thrives. While observation of species in the wild helps in growing plants, sometimes the unusual is what works best. If your growing area is open to dry winds, tree-fern is an excellent mounting material. It tends to retain moisture, and will last longer in a drier environment that in a closed house where humidity is maintained high.

Some species produce an annual flush of free-roaming roots, which last a couple of years and are replaced. *Sarcochilus hirticalcar* is one of these. I grow it in coarse bark within gutter guard tubes, and allow the roots to wander.



This *Dendrobium* carries a legacy of under-feeding as a seedling. I was given it around four years ago and began to feed it a little. This year it has shot away, and the four largest growths are the product of this spring growing period. The message is that good results for hard work might be some years away

I had it arrive from somewhere and have suffered two summers worth of outbreaks since. The severity of outbreak is reduced this second summer but would have been avoided altogether had I had quarantine procedures in place for new arrivals. The things I have tried spraying my orchids with to eradicate this pox have probably done more damage to my plants than the bacteria themselves, such as *Physan 20* and copper hydroxychloride sprays that are too strong burn and kill roots. Don't be heavy handed with sprays, weaker may be better.

Be prepared for this kind of heartbreak. You will receive diseased plants at some point, sooner or later. You will be slack with your quarantine. These diseases will spread and threaten your collection. The earlier the better in the long term. Unfortunately, nothing motivates the maintenance of your quarantine procedure better than bitter experience.

Diseases may cause ongoing chronic decline that may be irreversible. Be prepared to bin poor-performing plants, especially those that, three and four growing seasons on, are still performing poorly. Some diseases, and there are those that exist and persist in collections, are not worth the effort. Familiarize yourself with common and uncommon disease symptoms. This knowledge may save a large chunk of your collection if incursions of a serious disease are detected early.

There are websites with excellent illustrations of disease and pest symptoms, particularly that maintained by the St. Augustine Orchid Society (USA). Isolate suspected sick individuals that appear in your main growing area. Yes, this may mean you need a third growing area separate from both your quarantine and your growing areas.

Remember your life partner has to live with your plants too. Retain a consultative approach to the eventual domination of your living space by orchids. If you have to, start saving for a second block of land now (I'm advised to do this).

Cultural Aspects

Keep good spacing between your plants. This facilitates air movement which reduces disease incidence. Isolation by distance helps slow the spread of some pests and diseases, like scale and bacterial rots. Grow only as many plants as you have room for. It's easy to say and hard to do. If you must insist on obtaining more plants, find innovative ways of accommodating appropriate plants over a wider area. Don't sacrifice your spacing and low benching density in order to have more orchids.

Be patient. Don't panic if your sympodial plants don't make new growths every year. *Dendrobium speciosum* in particular may sit for one or two seasons doing apparently nothing. Don't be fooled by this, look inside and at the bottom of the pot and see where the growth is occurring.

Don't be heavy-handed with fertilizers. Fertilize weak and often. Weak. One quarter the recommended application rate is a good starting strength. Balanced fertilizers with some calcium nitrate are a good place to start. Complement these with weak organic

Predators can ruin all hard work and diligence in a single sitting. The best remedy for plant predators, including katydids, possums, and *Dendrobium* beetles is a physical barrier. Mine were a temporary structure erected around seven years ago, at a time I began my first house. In the time it has taken to get the house right for my site, my orchids have trebled. So these 'caravans' are still in use.

The caravans are simple structures, 25 mm blue water pipe looped into a 25 mm wire mesh, with shade cloth sewn in over the top and underneath, all upon a frame of H4 35 x 70 mm timber. All ingredients are available from local hardware stores. They are simple and effective, allowing plenty of air movement and watering through the shade cloth, but not ideal for getting at the plants. The message is plan ahead, you'll need around three times the growing space you currently think you do.

When you've run out of space, innovate. Here are some of my *Dendrobium speciosum* on the deck end-wall. They are hardy enough to take the heat, sun, wind, and cold, and they receive plenty of each.

fertilizers. Don't try and force your plants to perform for you right away.

Learn to ignore your orchids. Or if you can't do this, come up with a task list that does not involve watering. The list could include searching for scale in leaf axils, leaf undersurfaces and beneath bracts, checking for two-spotted mites, looking for evidence of slug and snail damage, removing dead leaves from the growing area, or writing articles about your failures.

If you must indulge your desire to grow the best orchids ever, try coming up with harmless tricks that mitigate this impulse. My favorite of late is to add two drops of *Seasol* to two litres of water and apply this as a light foliar feed on sunny and dry days. This makes me feel like I'm doing something for my plants, without adding detrimental amounts of water to them at an inappropriate time. This placebo has a great beneficial effect on the grower.

Be more concerned about air movement, ventilation, water, and light than winter minimum temperatures. The emphasis on winter minimum temperature in many books about orchids and orchid growing may inadvertently devalue the importance of air movement, ventilation and light. Especially air movement. Nothing seems to kill orchids faster than inadequate air movement. If you have fungi growing in or on your mix, you don't have enough air movement. If you have fungi growing on the bark under your benches (if you have bark), you don't have enough air movement. If all your orchids (and I mean all your orchids) develop *Fusarium*-like symptoms toward the end of summer, well, you don't have enough air movement. And you are probably also over-watering. If you have to wire the plants to the benches to prevent them being blown over, you may have enough air movement.

Plants will decline slowly or rapidly, but only ever recover slowly. Exceptions to this rule are the crucifix orchids, *Epidendrum ibaguense*, *E. radicans* and *E. secundum*. These seem to me to respond to changes in cultural conditions on a timescale of months and even weeks, rather than years, they go into decline and recovery rapidly, and could be useful as indicators of your general growing conditions. Best of all they respond at the growing tips by developing new leaves, at the bases of canes by initiating new canes, and by growing new roots, so they have plenty of ways to tell you what is going on. You can then spend at least three times as long looking at them, which will save your other orchids from a little bit more of your attention. I have employed a couple of these plants to tell me whether marginal locations in my backyard are too harsh, and I now keep a couple in the general growing area just to see how things are going.

Your plants will tolerate more light than you think. They might go red on the new growths, they might look a little shriveled, but they will enjoy the drying influence of more light, and the sterilizing influence of a bit of UV. Watch out for 40°C plus days. I tend to keep my plants dry and shaded on these hot days, and don't water until the temperatures come right down. I figure that dry hot roots might be better than wet hot roots, but I could be wrong and there may be better strategies for coping with heat. Talk to people about this and find out what works for other local growers.

Your plants will tolerate being drier than you think. No matter what the orchid books say, all orchids will tolerate drying out, even species *Phalaenopsis*. I dare you to try it and see. It is often repeated that more orchids are killed by over-watering than by any other single cause. Roots that lose their whiteness, turn yellowish, then brown and go mushy indicate over-watering, or a souring of mix, or over-fertilizing, or all of the above. Let your plants dry out. If you are not sure whether you should water or not, don't.

Be suspicious of, but don't over-react to, the latest blotch and blight on your leaves. Sometimes marks can be as inconsequential as ants biting into the new leaves to get at the plants juices. A given symptom can have multiple causes. Don't jump to conclusions about what ails your plants. Brown markings, patches and speckling on the root velamen and death of root tips may indicate fertilizer burn. Various nutrient deficiencies can cause disease-like symptoms. Seek advice before reacting. Most of all, take photos of it and make a note of what the problem was and what you did about it and when, and whether it worked or not. Celebrate your successes, but measure those successes on timescales of years.

Maintain hygiene procedures during collection management. If you regard every plant as carrying an undiagnosed virus, and act accordingly when repotting and dividing, you will do well. Record when you repot and divide your plants.

Philosophies and More Practices

Be prepared for failure, not everything will work for you and for the plants you choose to grow. Learn from your failures and keep notes about what you do with your orchids on a week by week basis, so that you can figure out what you do wrong.

The biggest clue to cultural micro-management is when the plants you ignore (the one you put up in the *Jacaranda* fork and have now forgotten about, or stuffed into the tree out the front and can't be bothered carrying the watering can to) perform better than the ones to which you are devoting all your spare time. Trust your plants to grow in the favorable conditions you provide them and leave them to that task. Think of your plants as a cabinet of responsible and trustworthy ministers who will each manage and deliver on their portfolio of sustained vegetative growth. Or of punctuated vegetative growth - in which case, respect your plants right to a dry winter dormancy. Learn about where your plants grow in the wild, what microsites they inhabit, and the seasonal weather patterns they experience in them. This knowledge will help you grow them better.

Let your plants dry out.

Plan on a time scale of growing seasons. It may take seven or eight growing seasons for a small division to establish and really start cranking, or for a poorly performing plant to fully recover. Your orchids have one of these a year. But don't over-pot in your enthusiasm for the spectacular results you are going to achieve. If it looks like it might need repotting, leave it. Wait until the plant is deforming the pot in its efforts to dominate your growing area before repotting it unless the mix has gone off, in which case repot, perhaps into the same size, and don't be afraid to pot down if plants have lost a lot of roots. Small pots will cycle through wet and dry phases even in the absence of water draw-down by a large mass of thirsty roots.

Talk to members of your society about data management strategies. A wealth of experience and technical prowess assembles at various halls around the country each month, or during online meetings, and is there to be tapped. You'll be able to see plants grown with skill, benched by people from whom you can find out how the results were achieved. And everyone at these meetings is there because they love the plants, talking about their plants, and swapping plants with one another. My young lady jokes that these monthly meetings I attend are really a secretive Orchids Anonymous. She knows the art of humor is telling people the truth so they might laugh at it. My name is Matt Renner, and I have a problem.

Matt Renner is a research scientist at Royal Botanic Gardens, Sydney and a keen Australian orchid grower.

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Two New Bougainvillean Species of *Dendrobium* section *Grastidium*

Text and illustrations Paul Ormerod, P.O. Box 8210, Cairns, Queensland 4870 | wsandave1@bigpond.com

Abstract

Continuing studies of *Dendrobium* section *Grastidium* reveal two previously unrecognised species from Bougainville, Papua New Guinea. Though externally similar, the two entities differ from each other and their purported relatives in floral colour and intricate details of the labellum. Thus, two new species are proposed, namely *D. arawanum* and *D. buinense.*

Key words. *Dendrobium, Grastidium,* new species, Bougainville.

The island of Bougainville, at about 200km long and 100 km wide, is the largest island in the Solomon Archipelago. Politically it is part of Papua New Guinea but recently the Bougainvillean people voted overwhelmingly for independence. In the last published count 130 orchids (11 endemic) were recorded from the island (Ormerod 2009), thus meaning that 8.5% of taxa were endemic. Since then, a few more taxa have been added to the flora such as *Calanthe solomonensis* Cribb & Clayton (also in the Solomon Islands), and *Glomera balbiensis* Ormerod. The addition of the two *Dendrobium* species described here brings the endemicity of the Bougainville orchid flora up to 10.5% (14 of 134 taxa). However further collecting in the Solomon Islands will probably reveal that some of these "endemics" from Bougainville will also occur further south.

Dendrobium Swartz section *Grastidium* Blume is the largest section in the genus, with about 225 species distributed from Sri Lanka and India to the Society Islands, 158 of which are found in New Guinea. The group is characterised by its elongate, leafy stems, short biflorous inflorescences that emerge from two pairs of sheaths, and ephemeral flowers (Clements & Jones 1997). Nine native species of section *Grastidium* have been recorded from Bougainville and the Solomon Islands (Lewis & Cribb 1991; Ormerod 2010), of which five are endemic. Thus, the Solomon Archipelago now has eleven native species, though one should expect there to be several more taxa due to the large number of species recorded from nearby New Guinea.

Tropical North Queensland houses all five species of section *Grastidium* that are known from Australia. None of the Australian species appear to be closely related to each other, two of which, namely *D. baileyi* F. Muell. and *D. insigne* (Blume) Miquel are known with certainty from nearby New Guinea. There is still however some debate over whether *D. cancroides* T.E. Hunt (similar to *D. gjellerupii* J.J. Sm.) and *D. luteocilium* H.M. Rupp (similar to *D. pruinosum* Teijsm. & Binn. *sensu lato*) also occur in New Guinea. The final species is *D. tozerensis* Lavarack, an entity with starry white flowers, it was the last endemic entity to be described back in 1977.

Though the two following taxa are based on single collections, I observed in the Lae herbarium several years ago two further Bougainvillean collections that may prove after critical study to be one of the species named here (namely *NGF 30568 & NGF 30617*).

Dendrobium arawanum Ormerod, *sp. nov.*

Type: Papua New Guinea, Bougainville, Kieta Subdistrict, Arawa, 15 m, cultivated, 12 April 1970, *A.N. Millar & J. Vandenberg NGF 48520* (Holotype: A!; Isotypes: BRI!, LAE!; CANB, image seen; BO, K, L, not seen). Figure 1.

Similar to *D. triste* Schltr. but with smaller flowers (sepals 8.5-9.2 vs. 15 mm long), the labellum with regular (vs. irregular) rows of transverse lamellae on the sidelobes, and a triangular (vs. broadly ovate) epichile almost covered by a brush of pubescence (vs. a medial patch of shorter pubescence).

Epiphytic herb. Roots and rhizome not seen. Stem

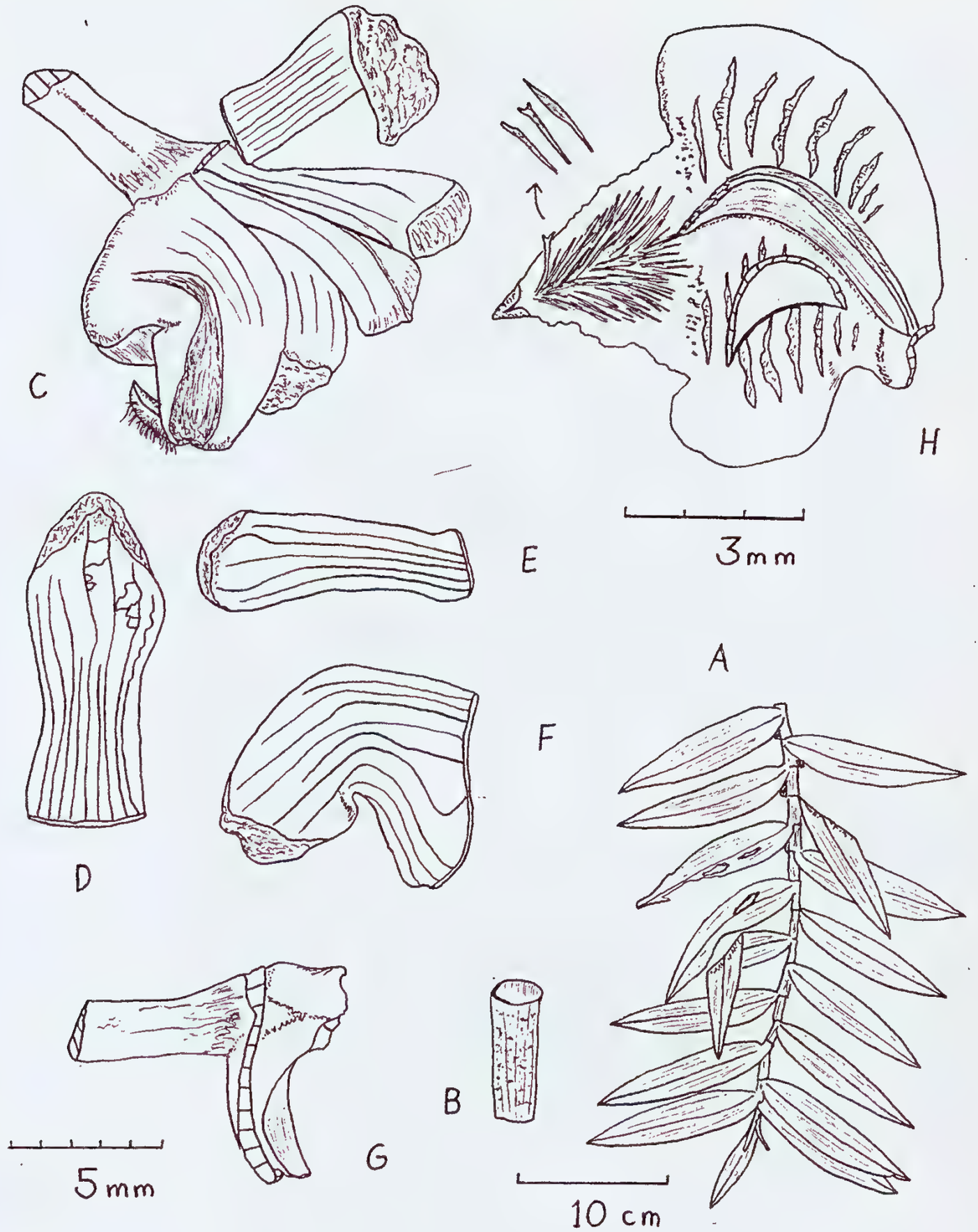

Figure 1. Dendrobium arawanum Ormerod – A. stem (upper part); B. leaf sheath (no scale); C. flower (dorsal sepal broken at base); D. dorsal sepal; E. petal; F. lateral sepal; G. column and foot; H. labellum (one side split). A drawn from BRI isotype, rest from holotype.

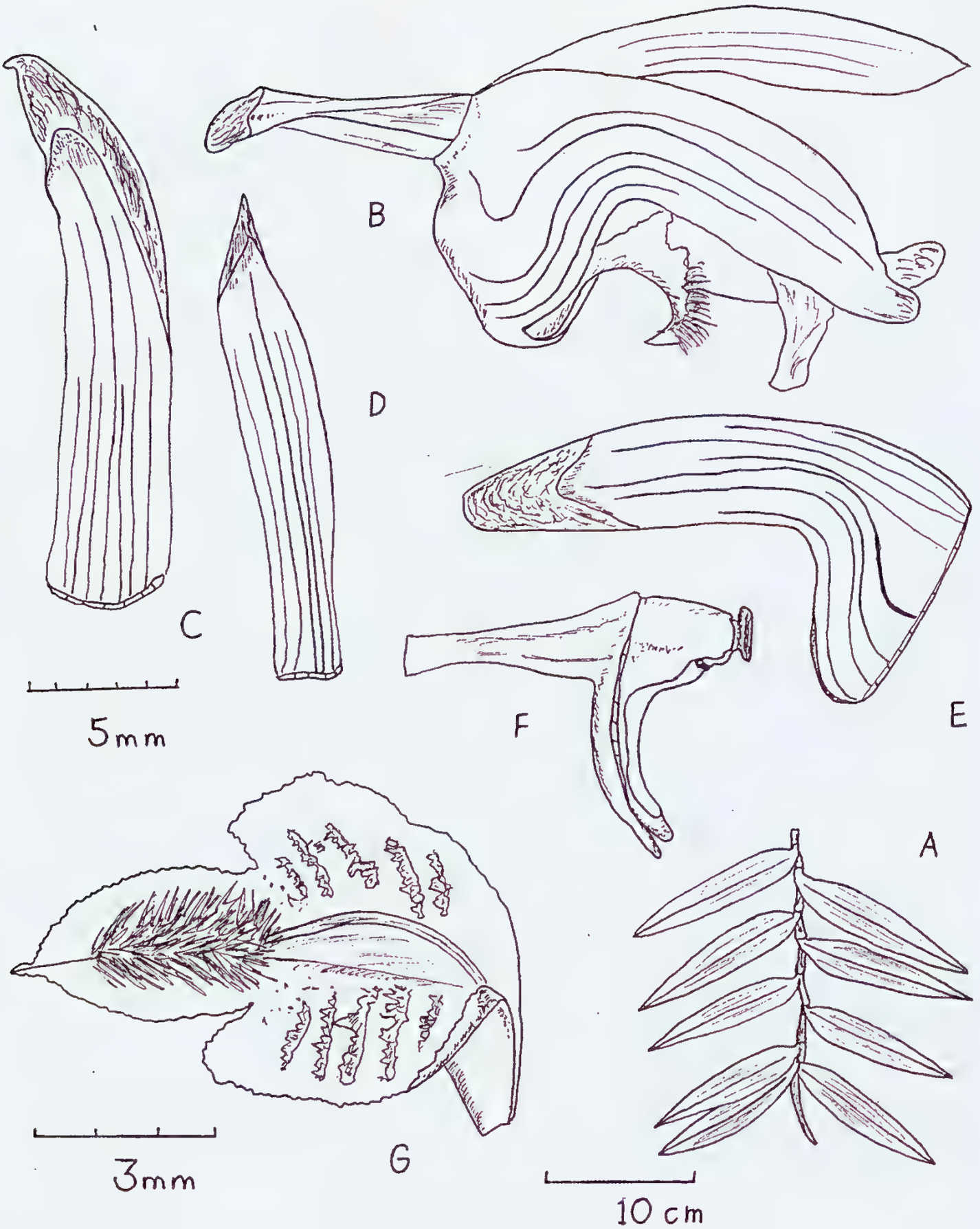

Figure 2. Dendrobium buinense Ormerod – A. stem (upper part); B. flower; C. dorsal sepal; D. petal; E. lateral sepal; F. column and foot; G. labellum. A drawn from BRI isotype, rest from holotype.

terete, elongate, sublaxly leafy, probably pendent, the preserved part 34 cm long, 4.5-5.5 mm thick, 5-6 mm wide across sheaths. Leaves oblong-lanceolate, obtusely, obliquely and unequally bilobed, coriaceous, bright mid-green, 11.0-12.2 cm long, 2.35-2.70 cm wide; leaf sheaths tubular, truncate, striate, minutely transversely rugose, 2 cm long. Inflorescences biflorous; outer peduncular sheath very short, *ca.* 1 mm tall, 6-7 mm wide; inner peduncular sheath semicircular, 5 mm tall, 5.5-6.0 mm wide. Flowers with sepals yellow outside, finely spotted purple inside, petals purplish, the lip with purple sidelobes, the midlobe white. Pedicel with ovary terete-subclavate, stout, 6-7 mm long. Dorsal sepal oblong-subpandurate, apex involute-subcucullate, 7-9-veined, erect, probably incurved in apical third, outside with midvein broadly clavately thickened, 10 mm long, 4 mm wide. Lateral sepals obliquely and falcately broad elliptic, apex involute-subcucullate, 9-veined, outside with midvein broadly clavately thickened, *ca.* 9.2 mm long (stretched), base 6.5 mm wide, middle 4 mm wide, forming with the column foot an obtuse, 4.5 mm long mentum. Petals oblong-oblanceolate, apex shortly involute-subcucullate, 5-veined, probably incurved in apical quarter, 8.5 mm long, 3.3 mm wide. Labellum trilobed, *ca.* 7 mm long, 6.5 mm wide; hypochile *ca.* 4 mm long, 6.5 mm wide, sidelobes with apices barely produced, obliquely truncate to obtuse, inside each side with about 9 rows of transverse, irregular lamellae, the apex with a transverse band of papillae and dentations each side of the keel; epichile triangular, with an involute, triangular, subacute apex, medially broadly pubescent from base to near apex, 2.95 mm long, 3 mm wide; median keel lamellate, smooth and unbroken except for the sloping front with pairs of short dentations. Column short and broad, *ca.* 2.75 mm long; column foot 3.9-4.0 mm long.

Distribution: Papua New Guinea (Bougainville).

Etymology: Named after the town of Arawa, the place where the type was cultivated and collected.

This species was among the many orchids that were cultivated at Kip McKillop's Arawa Plantation. It was noted as a "native epiphyte", and therefore one can assume it was collected somewhere on Bougainville. Sometimes these assumptions are incorrect and plants from the New Guinea mainland were erroneously labelled or believed to be native. *Dendrobium arawanum* is quite similar to *D. triste* Schltr. from mainland Papua New Guinea, but it differs from the latter in having smaller, differently coloured flowers (those of *D. triste* are dark purple), with regular rows of transverse lamellae on the sidelobes, and a large brush of pubescence (vs. shorter pubescence) on the epichile (midlobe).

Dendrobium salomonense Schltr. is a commonly collected species in the Solomon Archipelago. It differs from *D. arawanum* in its distinctly lanceolate leaves, and flowers in which the lip has a thick and broad (not lamellate) median callus that is terminated by a short brush of pubescence that does not extend onto the midlobe.

Dendrobium campbellii Cribb & B.A. Lewis is a poorly understood species from Rendova, and possibly Malaita in the Solomon Islands. Externally it much resembles *D. arawanum* but differs in critical floral details, such as the jagged (vs. smooth with dentations at the apex) lip keel which has a free ovate-lanceolate apex, in front of which is a patch of pubescence which reaches only onto the base of the midlobe.

Dendrobium buinense Ormerod, *sp. nov.*

Type: Papua New Guinea, Bougainville, Buin Subdistrict, Kugumaru, 150 m, 16 July 1930, *S.F. Kajewski 1947* (Holotype: AMES!; Isotype: BRI!). Figure 2.

Similar to *D. arawanum* Ormerod but with larger flowers (sepals 15.0-17.8 vs. 9.2-10.0 mm long), and thus having relatively narrower sepals, the labellum with irregularly dentate (vs. undulate margined) transverse lamellae on the sidelobes, and an elliptic (vs. triangular) epichile.

Epiphytic herb. Roots and rhizome not seen. Stems terete, elongate, sublaxly leafy, pendent, to 200 cm long, 4-5 mm thick. Leaves oblong-lanceolate, obtusely, unequally and obtusely bilobed, stiffly coriaceous, young leaves dark purple, older ones with purple veins below, 11.5-12.5 cm long, 2.4-2.8 cm wide; leaf sheaths tubular, truncate, striate, minutely, darkly transverse rugulose, 2.3-3.4 cm long. Inflorescences biflorous; peduncular sheaths disintegrated. Flowers brown cream-green. Pedicel

with ovary clavate, 6 mm long. Dorsal sepal ligulate-lanceolate, apex thickly cornute-subcucullate, acute, 7-veined, 17.8 mm long, 3.3-3.5 mm wide. Lateral sepals ligulate-lanceolate from obliquely expanded base, apex thickly cornute-subcucullate, obtuse, 7-veined, 15 mm long, base 7.9 mm wide, middle 3.5 mm wide, forming with the column foot an obtuse, 5.9 mm long mentum. Petals ligulate-oblanceolate, apex cornute, acute, 14.3 mm long, 3.1 mm wide. Labellum trilobed, *ca.* 8 mm long, 5 mm wide; hypochile *ca.* 5 mm long, 5 mm wide, sidelobes with irregular margins, with shortly produced apices, obtuse, inside each side with about 6 rows of irregularly dentate rows of transverse lamellae; epichile elliptic, subacuminate, medially broadly pubescent from base to near apex, *ca.* 3.2 mm long, 2.9 mm wide; median keel lamellate. Column short and broad, *ca.* 2.8 mm long; column foot *ca.* 5 mm long.

Distribution: Papua New Guinea (Bougainville).

Habitat: Common in rainforest, on trees.

Etymology: Named after the Buin Subdistrict at the south end of Bougainville, from where the type was collected.

This species appears almost vegetatively identical to *D. arawanum* but differs in its larger flowers, which are however more dully coloured, the lip has jagged internal lamellae on the sidelobes, and the midlobe is elliptic (not triangular). Florally it is more similar to *D. isabelense* Ormerod from Santa Isabel in the Solomon Islands since both share flowers about the same size, with the shape of the tepals and lip bearing much similarity. However, *D. isabelense* has lanceolate leaves, and the lip has subulate projections (not jagged lamellae) on the sidelobes, whilst the brush of pubescence on the midlobe is confined to its lower half.

Another similar species (especially in labellum shape) is *D. hamadryas* Schltr. from mainland Papua New Guinea. It differs from *D. buinense* in having smaller flowers (sepals 10 mm long), that are differently coloured (sepals closely brown-red spotted, lip yellow with red spots on the sidelobes), spatulate petals, and a labellum with more numerous, smaller, transverse lamellae on the sidelobes.

Acknowledgements

I wish to thank herbarium and library staff at the Harvard University Herbaria (A, AMES, GH) and the Queensland Herbarium (BRI) for their help and hospitality during my visits. Andrew Franks (Collections Manager, BRI) kindly imaged the BRI isotypes of the new taxa. Emma Toms (Imaging Co-ordinator, CANB) graciously imaged the CANB isotype of *Dendrobium arawanum.*

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Paul Ormerod has studied and described new species over several decades, particularly from New Guinea.

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Microclimates and Their Implementation in Newcastle, New South Wales

Text and Photos Carole Barnett | carolesbarnett@gmail.com

Summary

Techniques are described for reproducing natural microclimates for the Newcastle area. Eight microclimates can increase the success and satisfaction of growing plants to their optimum.

Introduction

I have been growing Australian orchids for fourteen years in a suburban environment and have found that by providing the best situation for individual orchids they ended up in groups. This arrangement of plants to suit their specific cultural needs resulted from the creation of a favourable artificial microclimate for each group. Replicating their cultural needs depends on an understanding of their natural environment, the ways growers can artificially achieve a similar effect, and managing the conditions and restrictions of a suburban backyard in Newcastle, New South Wales.

Natural Microclimates

A microclimate is the climatic condition in a relatively small area, within a few metres above and below the Earth's surface and within canopies of vegetation. Microclimates are caused by local differences in the amount of heat and water received or trapped near the surface. A microclimate may differ from its surroundings by receiving more energy, so it is a little warmer than its surroundings. Microclimatic conditions depend on factors such as temperature, humidity, wind and turbulence, dew, frost, heat balance and evaporation.

There are microclimates near bodies of water which may cool the local atmosphere. In heavy urban areas brick, concrete, and asphalt absorb the sun's energy, heat up, and re-radiate that heat to the ambient air. The resulting urban heat island is a microclimate.

Epiphytic orchids are often found in rainforest because this habitat provides most of their growing requirements. Rainforest is a general term for a range of forests with a closed canopy. Within the rainforest selection pressures are at work, with the orchids surviving where they receive suitable light, sufficient moisture and unimpeded air movement. Epiphytic orchids are not restricted to rainforests however, and can be found wherever suitable conditions of shade, warmth, humidity, air movement and rainfall occur. They are commonest in coastal districts and much less common in areas well inland from the coast.

Some species frequent open forest, especially humid forests on the ranges and tablelands and those around the fringe of rainforest communities. Other species occur on trees in or around swamps, beside watercourses and in deep gullies and gorges. Lithophytic species grow on rock outcrops, boulders, cliffs and escarpments, sometimes in shade but also in very exposed situations.

Terrestrial orchids comprise over 80% of named species and typically grow in sclerophyll open forests, heathland, grassland and swampy coastal scrub. They also can be found further inland than most epiphytes, some growing in areas receiving 500 mm or less in rainfall. The majority are adapted to the hot dry summers and moist cool winters typical of southern Australia, although they can be found growing in the tableland and coastal areas of central Queensland. Their dormancy over summer and underground storage organs, mostly tubers, protect them from the heat and dryness of summer. They reshoot in autumn with the arrival of cooler moist conditions. For the most part they can be housed in temperate shade house conditions, with a solid roof for the period of dormancy. Terrestrial orchids can cope with light frosts in winter and temperatures up to 40°C in the summer.

Artificial Microclimates

There are several ways of modifying the environment

to try to achieve a compatible microclimate for orchids growing outside their biogeographic region.

Cooling

Energy in the form of heat is required to evaporate water. As the heat comes into contact with the water a heat exchange occurs. As water evaporates it draws large amounts of heat from surrounding air. Evaporation is therefore an effective passive cooling method, although it works best when relative humidity is lower (70% or less during hottest periods) as the air has a greater capacity to take up water vapour. Rates of evaporation are increased by air movement.

The temperature of the water does not have any real effect on the cooling produced by the evaporation process. It is important to identify which orchids in a collection can be damaged by excess heat and provide the amount of cooling required.

Humidity/Misters/Foggers

Ultrasonic foggers have an advantage over other forms of humidification because of the small fog particles produced with an average droplet size of 5 microns. This resembles a natural fog that tends to hang in the air rather than rapidly fall to the ground. For this reason, fogging creates high humidity without making plants wet. Misters are directed so as to not wet plants, and timers conserve water usage. They can help cool a region by up to 5°C.

Evaporative cooling

Pools, ponds and water features can cool air. Carefully located water features and reservoirs of water, can create convective breezes. The surface area of water exposed to moving air is also important. Fountains, mist sprays and waterfalls can increase evaporation rates.

The construction of a mechanical evaporative cooler/wet wall requires pads that are located above a pond or other body of water, and the surrounding warm air blows through the pads. The pads are kept damp by water being pumped from the pond and dripping down through the pads back to the pond. As the outside warm air moves across the wet pad, water is evaporated, removing heat from the air. Therefore, after the air blows through the pads it is in a cooler state than when it entered the pads.

Heating

In cooler months there are several different methods of raising the temperature. Mechanical heating includes the use of electric heaters and the like to keep temperatures above the ambient air temperature outside. Passive heating helps to keep cost down after the initial outlay.

1. Black bins full of water under the benching to moderate the temperature. The bins absorb heat in the daytime and radiate it out at night.

2. Poly houses and glasshouses which warm up quickly in the sunshine.

3. Bubble wrap insulation helps to keep heat in poly/glass houses.

4. Radiant heat from surrounding structures such as brick walls.

Shade

Trees and shade cloth are the main providers of shade. Double, and in some case triple, layers of shade cloth can be used in the hotter months to provide increased shade.

Air Movement

Prevailing breezes and provision of fans can promote air movement. If there is no air movement around the leaf, the orchids cannot obtain enough water to cool their leaves through transpiration, and an orchid leaf can quickly burn even though the air temperature is below the maximum recommended temperature. Conversely, lots of air movement can allow an orchid to survive in an environment where air temperature is far above what is recommended.

Newcastle has a temperature range of 0–46°C, with cool wet winters and hot humid summers. I grow the orchids at the rear of my house, where I have created eight microclimates to provide reasonable growing conditions for housing my Australian orchid collection.

Area 1 Year-round light

The area has one layer of 50% shade cloth in winter,

Dendrobium moorei habitat, Mt Gower, Lord Howe Island Photo D. Butler

Area 6 Summer shade and cool - potted *Sarcochilus* and seedlings

Backyard sketch plan

and two layers of 50% in summer. The environment is modified by provision of air movement thru the use of fans, a single layer of 50% shade cloth in winter and an additional layer of 50% shade cloth added for the rest of the year. Cool growing Australian dendrobiums grow and flower quite happily in this environment, as do a number of *Dendrobium* hybrids.

The 2019 Gold Ira Butler Trophy winner, *Den.* Australian Butter Bright 'Razz' HCC/ANOS and *Den.* Australian Artist 'Helen' AM/AOC are two *Dendrobium* hybrids to be found in this area.

Area 2 Winter dry – grown dry with heat

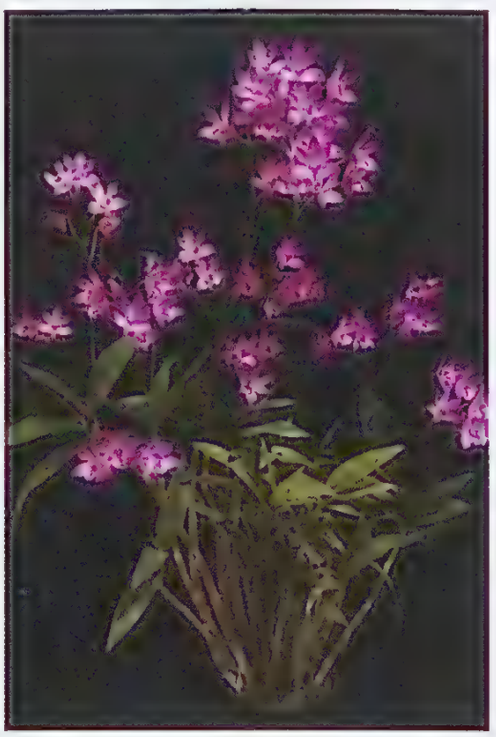
This area is set aside for the over-wintering of *Dendrobium* sect. *Spatulata* species and hybrids with Australasian parentage and *D. bigibbum* and consists of a north facing, insulated (bubble wrap) plastic house fitted with a tube heater with thermostat set to range 15–23°C, a water fountain constantly running for humidity, and a fan. Watering consists entirely of no more than a misting every few weeks on a warm winter's day or if/when the temperature goes over 25°C.

Dendrobium lichenastrum and *S. ceciliae* habitat, Burnett Creek Queensland

Area 4 Summer with high humidity - *Plectochilus* Kilgra

Area 4 Summer with high humidity - *Bulbophyllum bracteatum*

Area 5 Multi-tiered - *Sarcochilus ceciliae* grown high



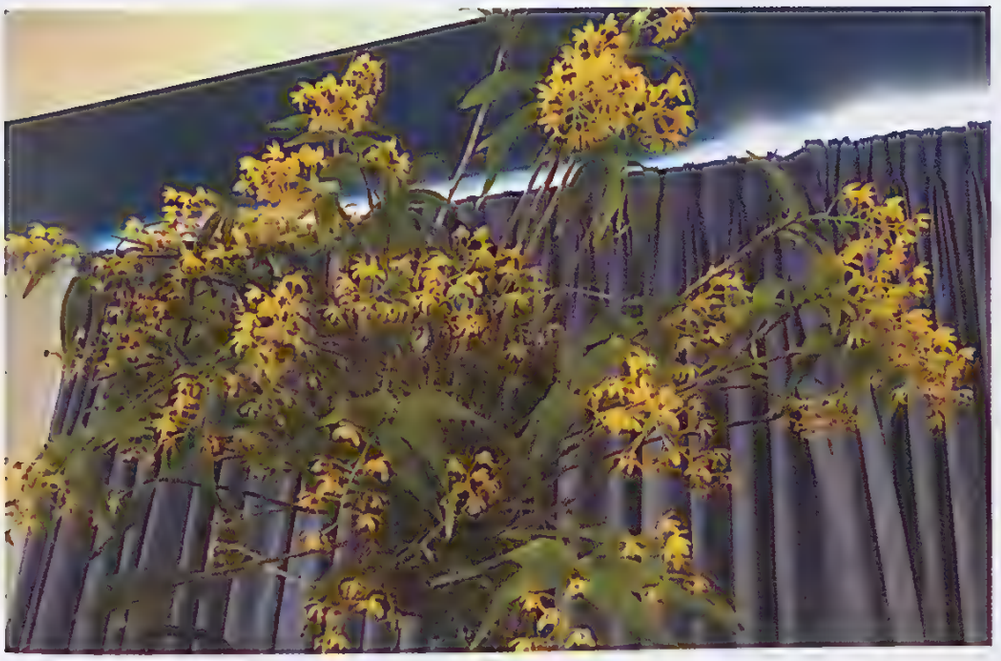
Area 1 Year-round light - *Dendrobium* Esme Poulton 'Tinonee'

Area 3 Winter dry – grown cold and dry under clear polycarbonate roofing

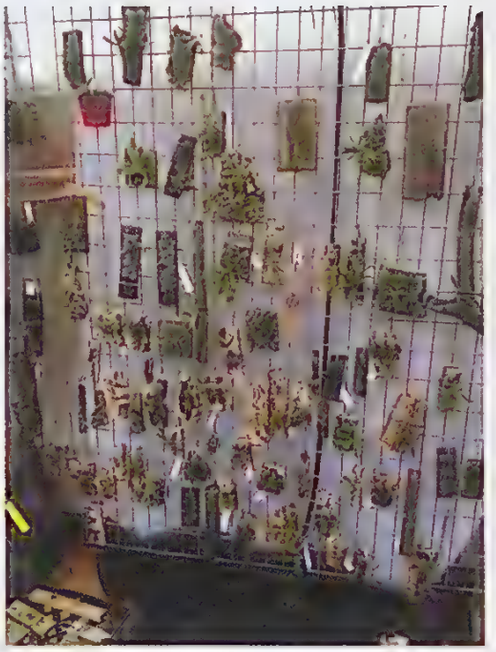
This is a WEST facing area with a large expanse of brickwork which retains heat through the day and therefore emits some radiant heat at night. There is no watering or misting except on days when temperature is over 25°C. *Cymbidium canaliculatum* plants are hung high under the roof to obtain as much light as possible through winter.

Area 4 Summer with high humidity

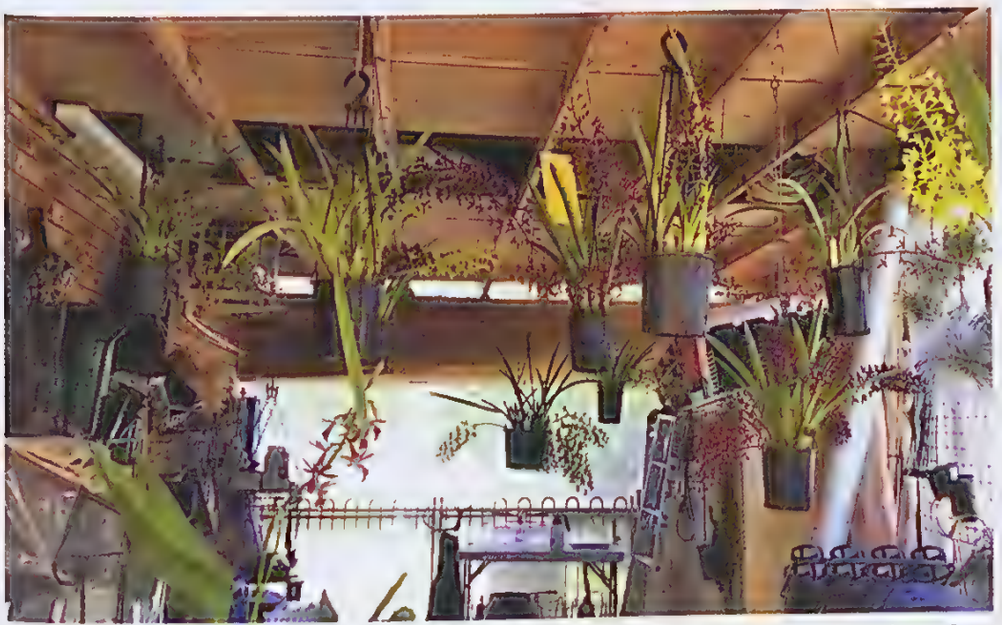
Features of this EAST facing area include a wet wall, ponds, dedicated misters and fans, daily misting and/or watering with triple layers of 50% shade cloth. This is suitable for mounted plants such as *Sarcochilus weinthalii, Plectorrhiza tridentata* and also *D. fleckeri*, *D. adae*, *D. falcorostrum* which like it cooler than the other areas can provide.



Area 1 Year round light - *Dendrobium gracilicaule*



Area 4 Summer with high humidity - mounted plants in front of wet wall



Cymbidium canaliculatum moved under the carport to improve longevity of flowers during a sudden heat wave

Area 4 Summer with high humidity - *Plectorrhiza beckleri* (syn. *Papillilabium beckleri)*

Area 3 Winter dry - *Dendrobium bigibbum* bench area

Area 7 Winter protection and additional light - *Cymbidium suave*

Area 5 Multi-tiered

Hanging plants at different heights can allow plants that require drier conditions and brighter light to co-exist on a vertical plane with those wanting higher humidity and more shade. This area is facing NORTH and features *Tillandsia usneoides* for buoyancy and is under one layer 90% shade cloth. It is a breezeway and receives regular misting/ watering – daily in summer, twice a week approx. in winter. It is suitable for free draining mesh pots and sock-mounted (gutter guard mounts filled with bark or other medium) *Sarcanthinae*, *D. tetragonum*, *D. canaliculatum* (summer only – grown under hard cover in winter).

Area 6 Summer – shade and cool

This area faces SOUTH under 90% shade cloth. It is a breezeway with medium light levels and is suitable for potted *Sarcanthinae* and seedlings. Recently deflasked seedlings spend the summer on the bottom shelves in this region. Fans are run continuously thru the day in summer months.

Area 7 Winter protection and additional light

A NORTH facing area with an opal polycarbonate roof. This area has bright light, provides protection for flowering orchids and the sunlight aids the initiation of spikes. It is suitable for hot/cold hybrids and flowering plants. Flowering *Cymbidium canaliculatum* tend to 'overflow' into this area in late spring when flowering, as space is at a premium!

Area 8 Summer – Morning sun

This area has double layer 50% shade cloth on the eastern side, a triple layer 50% shade cloth on western side, and directly overhead, borders the east/ front of the mounted section so they benefit from additional buoyancy, hanging for greater air flow. It is suitable for *Dendrobium* section *Rhizobium* and *D. lawesii,* a New Guinea species.

As I grow a variety of genre, I am continually watching to see if an orchid isn't happy and/or not performing to expectation, then making small changes as I endeavour to correct my culture. One successful example was when setting up Area 3 with a clear polycarbonate roof for winter. This assisted in an earlier flowering in 2019 allowing for *Cym. canaliculatum* 'PR-1' AM/ANOS to be open in time for the regions late spring shows and receiving both the first AM/ANOS for *Cymbidium canaliculatum* and becoming the Bill Murdoch Trophy winner for 2019. I am yet to successfully grow *S. australis* for any length of time…

Area 4 Summer with high humidity - *Dendrobium aemulum* grows here hanging high

Area 7 Winter protection and add. light - *Dendrobium* Australian Butter Bright 'Raz' HCC/ANOS 2019 (NSW)

Carole Barnett is a Certificated ANOS judge with a keen interest in the culture of Australian species and their hybrids.

Acknowledgements

Thanks to David Butler, John Andrews, Ken Russell, Neville Lee and Steve Howard for advice and encouragement.

Reference

Australian National Botanic Gardens www.anbg.gov.au

The *Sarcochilus* Galaxy Story

Text and Photos David Butler | david.greenvista@gmail.com

Introduction

Most orchid growers have their favourites and *Sarcochilus* Galaxy is certainly one of mine, partly because I was the fortunate hybridiser who bred and named it, enjoyed its success on the show bench and saw it become an important parent in breeding more colourful *Sarcochilus* hybrids. Surely enough to make it special, but there remains something hard to define. It may just be that along the way it nearly didn't come about despite many years of patient hybridising or that it was a key player in helping one line of yellow-coloured flowers acquire classic size and shape, or perhaps more simply the unexpected way its yellow flowers brighten up my bush house throughout the year. This is the *Sarcochilus* Galaxy story.

In the Beginning

The story began in 1992 with my acquisition of a small plant of *Sarcochilus* Aussie Dawn (*S. hartmannii* x *S. dilatatus*), which in 1996 produced a shower of dainty golden flowers. My intention was to cross it with a good *S. hartmannii* to produce the then popular hybrid *S.* First Light, but as a plant of *S.* Riverdene (*S. hartmannii* x *S. hirticalcar*) was in flower, a change of plan occurred. Bringing the two together created *S.* Aussie Dawn x *S.* Riverdene, later to be named *Sarcochilus* Misty – imagining the mist on the river at dawn – which was possibly the first time a combination of two twig epiphytes had been used in a complex hybrid. The *S.* Galaxy story almost ended at this point due to a lack of much viable seed and poor germination which saw only five of the seedlings reach maturity. Of these, three were introduced into my breeding program, but only *Sarcochilus* Misty 'Spangles' was to become a parent of note.

Sarcochilus Misty 'Spangles'

The strong floral colour and large labellum of *S.* Misty 'Spangles' were stand-out features, and no doubt inherited from the two diminutive species in its make-up, while the much-improved shape came from the 50% *S. hartmannii*. Once it reached maturity it readily accepted pollen, formed seed capsules, and produced viable seed, but remained a single growth for the whole of its ten-year life. However it was not successful as a pollen parent, a trait passed on to its progeny. Six of the next generation hybrids produced between 2000–08 were named and registered. An apparent delay in their registration was due to a firm policy at that time which required seedlings to produce their first flowers before the Royal Horticultural Society at Kew would accept an application.

The first pollination of *S.* Misty in 2000 was with pollen from *S. hartmannii* 'Ginger Snow' (parentage 'Red Snow' x 'Yellow Snow'). Good germination gave plenty of seedlings, and the cross was repeated the following year. Why this was done is obscure because *S. hartmannii*, while improving the shape of its hybrids, usually dilutes colour. Perhaps I used a crystal ball to see into the future because, out of all the pollinations of *S.* Misty 'Spangles', it was these two which played such an important role in the quest for strongly coloured classic-shaped flowers.

Sarcochilus Galaxy

On flowering, the seedlings of *S.* Misty x *S. hartmannii* were well-shaped and many were a surprisingly bright yellow. With perhaps a grateful glance heavenward I named the hybrid *Sarcochilus* Galaxy and viewed it, even at that early stage, as a key parent in yellow hybridising. A greater range of colours appeared as more seedlings flowered, mostly in shades of yellow but also tawny, an occasional crystalline white, and some were attractively splashed. As some plants remained single growths, a trait passed on from *S.* Misty, floriferous and clumping plants displaying strongly coloured flowers were particularly sought out as future parents.

A variation in the colour of foliage and racemes also became evident, ranging from the normal green through to a strong burgundy. Dark-coloured plants are often held in collections for their foliage alone, although it did become clear that the colour of the foliage and racemes was often unrelated to that of the flowers. However, the disappointment of seeing dark-foliaged seedlings produce white flowers is soon overcome by pleasure when other seedlings achieve a striking effect by having dark foliage and colourful flowers.

Sarcochilus Galaxy 'Cream 2011' AM/ANOS 2016 (NSW)

Sarcochilus Galaxy 'Plastic Gold'

Sarcochilus Galaxy Flash

Sarcochilus Galaxy 'Pale Flare'

Sarcochilus Galaxy 'Flat Yellow'

Sarcochilus Galaxy 'Cute'

Sarcochilus (Galaxy x Amelia) 'Good Red'

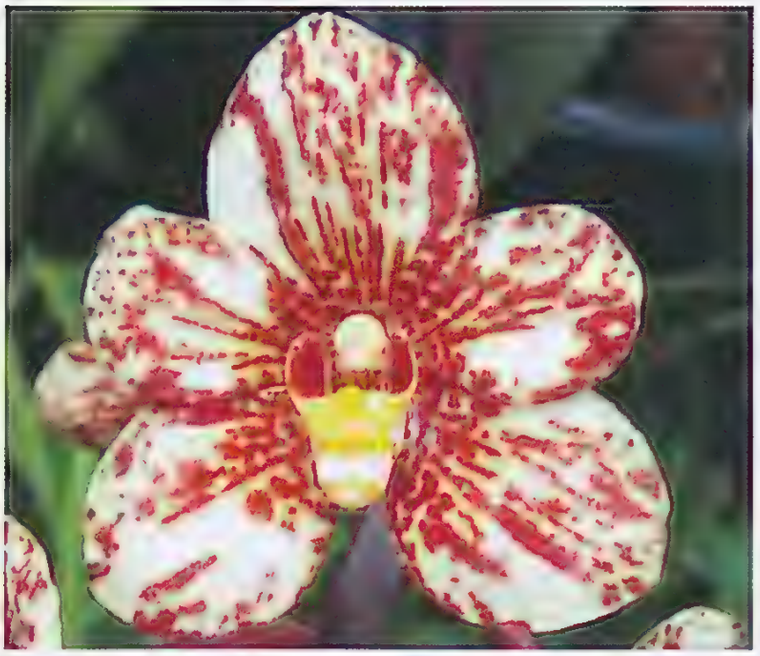
Sarcochilus Evening Star 'Red and Yellow'

Sarcochilus Space Race 'Yellow'

Sarcochilus Surprise 'Nice Small Red'

Sarcochilus Surprise 'Pinky Cream'

Sarcochilus Surprise 'Yellow'



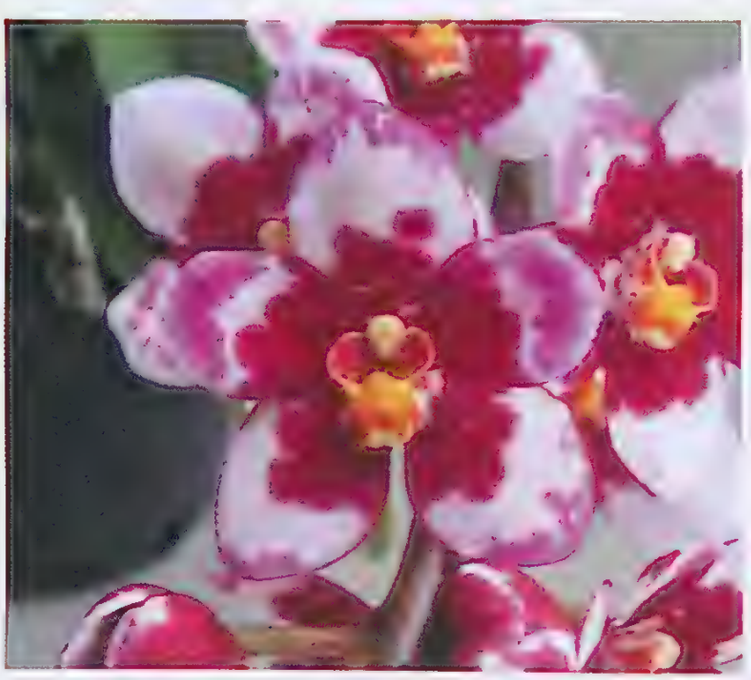
Sarcochilus Sundaani's Galaxy 'Streaks'

Sarcochilus Sundaani's Galaxy 'Tawny Glow'
Note dark foliage.

Sarcochilus Amber Star 'Splashed'

Sarcochilus Amber Star 'Tawny'

Sarcochilus Sundaani's Galaxy 'Burgundy'



Sarcochilus (Maria x Allure) 'Pretty 2020'

This is shown in *S.* Sundaani's Galaxy 'Tawny Glow'.

Breeding Yellows – Two Distinct Lines

Sarcochilus hybridising over time has seen the breeding of yellow flowers progress along two distinct lines, one based on the line-breeding of albinistic parents which were devoid of red pigment, and those bred from the miniature colourful species as discussed in this article. The two lines are readily identifiable as there is a lack of red pigment in the albinistic flowers, while hybrids bred from *S.* Galaxy have flowers with a most obvious red centre. Another recognisable feature of *S.* Galaxy hybrids is the generous size of the labellum inherited from the twig epiphytes *S. dilatatus* and *S. hirticalcar*, in contrast to the small labellum of the albinistic flowers, which are derived largely from *S. hartmannii*.

A constraint when breeding with *S.* Galaxy is that it is only viable as the seed parent, meaning that *S.* Galaxy plants cannot be bred together or back-crossed to *S.* Misty or *S.* Aussie Dawn. The selfing of *S.* Galaxy flowers has not proved possible. Seeking out good coloured flowers to act as pollen parents can prove frustrating but one answer lies in the use of strongly coloured albinistic flowers, as these hybridise readily with *S.* Galaxy. Combining the two breeding lines has proved fortuitous in other ways, as the resulting progeny usually display shapely flowers with clarity of colour, large attractively marked labellums, and strong racemes.

The Next Generation

When *S.* Galaxy was first used as a parent the only plants available to hybridisers were from the original two crossings of *S.* Misty 'Spangles' x *S. hartmannii* 'Ginger Snow'. A remake followed (*S.* Misty 'Spangles' x *S. hartmannii* 'Baby BS #2' AM/ANOS) and later The Australian Orchid Nursery sold mericlones of *S.* Galaxy plants with attractive yellow flowers. The popularity of using *S.* Galaxy as a parent is evident in it having twenty-three Royal Horticultural Society hybrid registrations as a parent, which invariably show it as the seed parent. Apart from *S.* Fitzhart it is the hybrid with most registrations as seed parent and its popularity continues even though the hybridiser needs to own, or have access to, a parent plant.

Mixing Colours

Another breeding line began with the tentative crossing together of yellow *S.* Galaxy flowers and deep-red flowers from other hybrids, with surprisingly good results. Further hybridising followed with *S.* Galaxy being crossed with a whole range of differently coloured hybrids to produce rich reds, red/yellow bi-colours, and autumn tones, with many flowers splashed or edged in contrasting colours. This range of colours and markings can be seen in *S.* Surprise (*S.* Galaxy x *S.* Velvet), which flowers throughout the year and often has one raceme finishing as another begins to open its first flowers. *Sarcochilus* Surprise 'Bright Red Brown' shows a single growth plant readily carrying two seed capsules on one raceme and another heavily in flower.

Conclusion

It would be great if remakes of *S.* Misty were to exist which have the ability to act as both seed and pollen parent, but I think this may be wishful thinking. Plants of *S.* Galaxy, therefore, are probably only available by division or mericloning of existing plants, but its descendants are in abundance and they too are proving excellent parents. Eventually *Sarcochilus* Galaxy may get to retire, happy that it was a critical milestone in the unending quest to breed better hybrid *Sarcochilus*.

David Butler is a successful Sydney hybridiser of Sarcochilus *for many years. All the photographs in this article are plants bred by him.*

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#382 *Sarcochilus* Harold 'Angel' HCC/ANOS 2019 (VIC)

Points	77.60
Owner	Adams, Peter and Sheryl
Date & Event	11 December 2019
Photos By	Peter Adams
#Flowers/influorescences	45 / 3
Measurements (mm):	
Flower: across 30, vert. 40 Petal: 14L, 7W Sepal: 18L, 10W	Dorsal: 19L, 6W Labellum: 9L, 6W Inflorescence Length: 280
Detailed avg. points:	
Shape (25): 19.2 Colour (20): 15.4 Size (15): 12.2	Substance/Texture (10): 7.8 Floriferousness (15): 11.4 Habit/Attractive (15): 11.6

#383 *Sarcochilus* Effie 'Christine' AM/ANOS 2019 (VIC)

Points	82.40
Owner	Adams, Peter and Sheryl
Date & Event	11 December 2019
Photos By	Peter Adams
#Flowers/influorescences	48 & 5 buds / 3
Measurements (mm):	
Flower: across 30, vert.35 Petal: 14L, 8W Sepal: 14L, 10W	Dorsal: 16L, 5W Labellum: 8L, 6W Inflorescence Length: 340
Detailed avg. points:	
Shape (25): 20.2 Colour (20): 16.8 Size (15): 12.4	Substance/Texture (10): 8.0 Floriferousness (15): 12.6 Habit/Attractive (15): 12.4

#384 *Sarcochilus* Effie 'Sheryl' HCC/ANOS 2019 (VIC)

Points	80.10
Owner	Adams, Peter and Sheryl
Date & Event	19 December 2019
Photos By	Peter Adams
#Flowers/influorescences	107 / 8
Measurements (mm):	
Flower: across 34, vert. 35 Petal: 16L, 8W Sepal: 18L, 10.5W	Dorsal: 18L, 12.5W Labellum: 9L, 7W Inflorescence Length: 320
Detailed avg. points:	
Shape (25): 19.6 Colour (20): 15.9 Size (15): 12.1	Substance/Texture (10): 7.5 Floriferousness (15): 12.7 Habit/Attractive (15): 12.3

#385 *Sarcochilus* Olive Nymph 'Mulberries' HCC/ANOS 2019 (VIC)

Points	78.80
Owner	Adams, Peter and Sheryl
Date & Event	20 December 2019
Photos By	Peter Adams
#Flowers/inflorescences	38 and 2 buds / 3
Measurements (mm):	
Flower: across 34, vert. 29 Petal: 16L, 7.5W Sepal: 17L, 9W	Dorsal: 18L, 10W Labellum: 8.5L, 6W Inflorescence Length: 245
Detailed avg. points:	
Shape (25): 19.6 Colour (20): 17.2 Size (15): 11.7	Substance/Texture (10): 7.8 Floriferousness (15): 11.3 Habit/Attractive (15): 11.2

#386 *Sarcochilus* Effie 'Amelia' AM/ANOS 2019 (VIC)

Points	82.64
Owner	Adams, Peter and Sheryl
Date & Event	19 December 2019
Photos By	Peter Adams
#Flowers/inflorescences	67 and 1 bud / 5
Measurements (mm):	
Flower: across 31, vert. 31 Petal: 15L, 8W Sepal: 17.5L, 9W	Dorsal: 18L, 10W Labellum: 7.5L, 9.5W Inflorescence Length: 250
Detailed avg. points:	
Shape (25): 20.83 Colour (20): 16.66 Size (15): 12	Substance/Texture (10): 8.41 Floriferousness (15): 12.58 Habit/Attractive (15): 12.16

#387 *Sarcochilus* Effie 'Ena' HCC/ANOS 2019 (VIC)

Points	78.17
Owner	Adams, Peter and Sheryl
Date & Event	19 December 2019
Photos By	Peter Adams
#Flowers/inflorescences	26 / 2
Measurements (mm):	
Flower: across 32, vert. 33 Petal: 14L, 9W Sepal: 15L, 10W	Dorsal: 16L, 11W Labellum: 9L, 7W Inflorescence Length: 270
Detailed avg. points:	
Shape (25): 20.25 Colour (20): 15.83 Size (15): 11.33	Substance/Texture (10): 7.92 Floriferousness (15): 11.17 Habit/Attractive (15): 11.67

#388 *Sarcochilus* Effie 'Ena' ACC/ANOS 2019 (VIC)

Points	80.0
Owner	Adams, Peter and Sheryl
Date & Event	19 December 2019
Photos By	Peter Adams
#Flowers/inflorescences	26 / 2
Measurements (mm):	
Flower: across 32, vert. 33 Petal: 14L, 9W Sepal: 15L, 10W	Dorsal: 16L, 11W Labellum: 9L, 7W Inflorescence Length: 270
Detailed avg. points:	
Shape (25): Colour (20): Size (15):	Substance/Texture (10): Floriferousness (15): Habit/Attractive (15):

#389 *Dendrobium* Jayden 'Greta' AM/ANOS 2019 (NSW)

Points	81.30
Owner	van den Berg, Henk
Date & Event	14 September 2019
Photos By	Bill Dobson
#Flowers/inflorescences	234 & 40 buds / 18
Measurements (mm):	
Flower: across 52, vert. 65 Petal: 34L, 9W Sepal: 40L, 8W	Dorsal: 40L, 8W Labellum: 25L, 12W Inflorescence Length: 350
Detailed avg. points:	
Shape (25): 20.5 Colour (20): 17.3 Size (15): 12.3	Substance/Texture (10): 7.8 Floriferousness (15): 11.5 Habit/Attractive (15): 12

#390 *Dendrobium* Kalon Byrne-Dimos 'Purple Lip' AM/ANOS 2019 (NSW)

Points	81.10
Owner	Chan, Yin and Sau-wan
Date & Event	14 September 2019
Photos By	Bill Dobson
#Flowers/inflorescences	218 & 19 buds / 105
Measurements (mm):	
Flower: across 40, vert. 30 Petal: 21L, 5W Sepal: 24L, 7W	Dorsal: 22L, 6W Labellum: 14L, 9W Inflorescence Length: 30
Detailed avg. points:	
Shape (25): 20.2 Colour (20): 16.7 Size (15): 11.8	Substance/Texture (10): 8 Floriferousness (15): 12.4 Habit/Attractive (15): 12

#391 *Dendrobium* Kalon Byrne-Dimos 'Purple Lip' ACC/ANOS 2019 (NSW)

Points	80.20
Owner	Chan, Yin and Sau-wan
Date & Event	14 September 2019
Photos By	Bill Dobson
#Flowers/inflorescences	218 & 19 buds / 105
Measurements (mm):	
Flower: across 40, vert. 30 Petal: 21L, 5W Sepal: 24L, 7W	Dorsal: 22L, 6W Labellum: 14L, 9W Inflorescence Length: 30
Detailed avg. points:	
Shape (25): Colour (20): Size (15):	Substance/Texture (10): Floriferousness (15): Habit/Attractive (15):

#392 *Dendrobium tetragonum* 'Red Hot' AM/ANOS 2019 (NSW)

Points	82.70
Owner	van den Berg, Henk
Date & Event	14 September 2019
Photos By	Bill Dobson
#Flowers/inflorescences	205 & 2 buds / 19
Measurements (mm):	
Flower: across 26, vert. 43 Petal: 15L, 1W Sepal: 22L, 4W	Dorsal: 20L, 4W Labellum: 6.5L, 6.5W Inflorescence Length: 24
Detailed avg. points:	
Shape (25): 20.8 Colour (20): 17.3 Size (15): 11.7	Substance/Texture (10): 7.6 Floriferousness (15): 12.9 Habit/Attractive (15): 12.3

#393 *Dendrobium tetragonum* 'Red Hot' ACC/ANOS 2019 (NSW)

Points	83.00
Owner	van den Berg, Henk
Date & Event	14 September 2019
Photos By	Bill Dobson
#Flowers/inflorescences	205 & 2 buds / 19
Measurements (mm):	
Flower: across 26, vert. 43 Petal: 15L, 1W Sepal: 22L, 4W	Dorsal: 20L, 4W Labellum: 6.5L, 6.5W Inflorescence Length: 24
Detailed avg. points:	
Shape (25): Colour (20): Size (15):	Substance/Texture (10): Floriferousness (15): Habit/Attractive (15):

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RBG00022204

#394 *Sarcochilus australis* 'Gibraltar' AM/ANOS 2019 (NSW)

Points	82.80
Owner	Harrison, Michael
Date & Event	15 November 2019
Photos By	Greg Steenbeeke
#Flowers/inflorescences	36 / 4
Measurements (mm):	
Flower: across 17, vert. 23.3 Petal: 10L, 3W Sepal: 10L, 4W	Dorsal: 12L, 5W Labellum: 8L, 10W Inflorescence Length: 122
Detailed avg. points:	
Shape (25): 21.2 Colour (20): 16.3 Size (15): 12.1	Substance/Texture (10): 8.2 Floriferousness (15): 12.3 Habit/Attractive (15): 12.7

#395 *Sarcochilus australis* 'Gibraltar' ACC/ANOS 2019 (NSW)

Points	82.50
Owner	Harrison, Michael
Date & Event	15 November 2019
Photos By	Greg Steenbeeke
#Flowers/inflorescences	36 / 4
Measurements (mm):	
Flower: across 17, vert. 23.3 Petal: 10L, 3W Sepal: 10L, 4W	Dorsal: 12L, 5W Labellum: 8L, 10W Inflorescence Length: 122
Detailed avg. points:	
Shape (25): Colour (20): Size (15):	Substance/Texture (10): Floriferousness (15): Habit/Attractive (15):

#396 *Sarcochilus* Bessie 'Yunlan' HCC/ANOS 2019 (NSW)

Points	76.10
Owner	Chan, Yin and Sau-wan
Date & Event	19 October 2019
Photos By	Bill Dobson
#Flowers/inflorescences	20 & 10 buds / 3
Measurements (mm):	
Flower: across 28, vert. 28 Petal: 12L, 11W Sepal: 15L, 11W	Dorsal: 18L, 12W Labellum: 8L, 6W Inflorescence Length: 250
Detailed avg. points:	
Shape (25): 20.4 Colour (20): 15 Size (15): 12.4	Substance/Texture (10): 7.7 Floriferousness (15): 9.8 Habit/Attractive (15): 10.9

Vale Wayne Harris

One of our foremost authorities on Australian native orchids, Wayne Harris, passed away peacefully on the 21 November 2020 at 81 years of age at the Sunshine Coast University Hospital with loving family by his side.

Wayne was born October 11, 1939 in Adelaide, South Australia, eldest child of Francis and Marjorie and brother to Pauline. Wayne's inquisitive mind led him to pursue a career in science with geology and botany, his primary occupation for many years before branching out into other specialties including his greatest love, orchids.

His work at the Queensland Herbarium at Mt Coot-tha lead Wayne and Jean to move from Toowoomba to The Gap in the early 1990s, and he joined the ANOS Kabi group and the Orchid Species Society.

In those early days ANOS judging was limited to Sydney but it was decided to expand throughout Australia, starting with Queensland. On account of extensive knowledge of Australian orchids and experience in AOC judging, 3 people were appointed as full ANOS judges: John Hazelwood, John Woolf and Wayne.

These three then delivered the ANOS judging course to a group of about ten enthusiasts and they eventually formed the first judging panel outside of Sydney under Wayne's leadership as Registrar. He also served a term as one of the first ANOS National Registrars of Judges before retiring and leaving others to continue the good work he had been instrumental in kicking off. He was also an AOC judge for many years.

Wayne co-authored (with Bill Lavarack and Geoff Stocker) a wonderful book, *Dendrobium and its Relatives*, featuring many of his magnificent photographs taken over many years of field experiences in many parts of the world, especially PNG & Borneo. He specialised in growing *Bulbophyllum*, *Dendrobium* and Asian species.

Wayne was the chief editorial consultant for a fabulous little book on orchid species of the world, *Botanica's Orchids*, which should be on every orchid grower's bookshelf. He also contributed articles to a number of orchid publications, both in Australia & abroad.

Wayne will be forever loved by wife Jean, his sons Mark and Daniel, daughter Joanna, sister Pauline, son in law Stuart, daughter in law Tanya, grandchildren Lachlan and Molly and all extended family and wonderful friends.

He will be remembered by us all as an intelligent, witty, kind and generous man who had many great achievements in his life.

Dave Groffen

ANOS Inc. Membership

Personal membership of ANOS Inc. includes a subscription to *The Orchadian*. Individuals suscribing to *The Orchadian* will automatically receive membership of ANOS Inc. Members receive four issues a year and have full voting rights at the AGM.

An optional two year membership/subscription is strongly encouraged for yourself and increasing efficiency for the Membership Officer, Secretary and Treasurer.

Subscription Rates (in $AU)

1 July 2020 - 30 June 2021

Australia	$55.00
New Zealand	$65.00
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Rest of World	$80.00

Subs will be due from 1 July 2020.

The membership/subscription form is avilable on line at: www.anos.org.au

Sarcochilus australis 'Gibraltar' AM-ACC/ANOS 2019 (NSW)

Photo G. Steenbecke